

UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549

FORM S-3

REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933

SPECTRAL AI, INC.  
(Exact name of registrant as specified in its charter)

Delaware  
\_\_\_\_\_  
(State or other jurisdiction of  
incorporation or organization)

95-4484725  
\_\_\_\_\_  
(I.R.S. Employer  
Identification Number)

2515 McKinney Avenue, Suite 1000  
Dallas, TX 75201  
972-499-4934  
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

Vincent S. Capone, Esq.  
Chief Financial Officer and General Counsel  
2515 McKinney Avenue, Suite 1000  
Dallas, TX 75201  
(972) 499-4934  
(Name, address, including zip code, and telephone number, including area code, of agent for service)

*Copies of all communications, including communications sent to agent for service, should be sent to:*

Herbert F. Kozlov Esq.  
Lynwood E. Reinhardt, Esq.  
Reed Smith LLP  
599 Lexington Avenue  
New York, New York 10022-7650  
(212) 521-5400

**Approximate date of commencement of proposed sale to the public:** From time to time after the effective date of this Registration Statement.

If the only securities being registered on this Form are being offered pursuant to dividend or interest reinvestment plans, please check the following box:

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, other than securities offered only in connection with dividend or interest reinvestment plans, check the following box:

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective upon filing with the Commission pursuant to Rule 462(e) under the Securities Act, check the following box.

If this Form is a post-effective amendment to a registration statement filed pursuant to General Instruction I.D. filed to register additional securities or additional classes of securities pursuant to Rule 413(b) under the Securities Act, check the following box.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	<input type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input checked="" type="checkbox"/>	Smaller reporting company	<input checked="" type="checkbox"/>
		Emerging growth company	<input checked="" type="checkbox"/>

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided to Section 7(a)(2)(B) of the Securities Act.

**The registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the registrant shall file a further amendment which specifically states that this registration statement shall thereafter become effective in accordance with section 8(a) of the Securities Act of 1933 or until the registration statement shall become effective on such date as the Commission acting pursuant to said section 8(a), may determine.**



**The information in this prospectus is not complete and may be changed. These securities may not be sold until the registration statement is effective. This prospectus is not an offer to sell these securities, and we are not soliciting offers to buy these securities, in any state or other jurisdiction where the offer or sale is not permitted.**

**SUBJECT TO COMPLETION, DATED APRIL 24, 2025**

PRELIMINARY PROSPECTUS



**Up to 2,836,918 shares of Common Stock**

This prospectus relates to the resale from time to time by the selling stockholders named in this prospectus or their permitted transferees (the “selling stockholders”) of up to 2,836,918 shares of our common stock, par value \$0.0001 (“common stock”), issuable upon the exercise of warrants to acquire shares of common stock (“Warrants”), which consists of (i) 768,072 Warrants with an exercise price of \$1.66 per Warrant issued to Avenue Ventures Fund II, L.P. (“Avenue”) pursuant to a Loan and Security Agreement, dated March 21, 2025, by and among the Company, Spectral MD Holdings LLC, Spectral MD, Inc. and Avenue (the “LSA”); (ii) 1,153,846 Warrants with an exercise price of \$1.80 per Warrant issued to certain investors in the United States (the “US Investors”) pursuant to a securities purchase agreement, dated March 21, 2025, by and between the Company and Dominari Securities LLC (the “Dominari Purchase Agreement”); and (iii) 915,000 Warrants with an exercise price of \$1.80 per Warrant issued to certain investors in the United Kingdom (the “UK Investors,” and together with the US Investors, the “Investors”), pursuant to a securities purchase agreement, dated March 21, 2025, by and among the Company and the UK Investors (the “UK Purchase Agreement” and, along with the LSA and Dominari Purchase Agreement, the “Purchase Agreements”) on the same economic terms as the Dominari Purchase Agreement. See “Summary; Purchase Agreements” for more information. We are registering the resale of the common stock as required by the registration rights included in the Purchase Agreements, as amended.

We will not receive any proceeds from the sale of the common stock by the selling stockholders pursuant to this prospectus.

The selling stockholders may offer, sell or distribute all or a portion of the securities hereby registered publicly or through private transactions at prevailing market prices or at negotiated prices. We are required to pay certain costs, expenses and fees in connection with the registration of these securities, including with regard to compliance with state securities or “blue sky” laws. The selling stockholders will bear all commissions and discounts, if any, attributable to their sale of shares of common stock. See the section titled “Plan of Distribution.”

You should carefully read this prospectus and the applicable prospectus supplement as well as the documents incorporated or deemed to be incorporated by reference in this prospectus before you purchase any of the securities offered hereby. You should also read the documents we refer to in the “Where You Can Find More Information” section of this prospectus for information on us and our financial statements.

Our common stock is listed on The Nasdaq Capital Market (the “Nasdaq”) under the symbol “MDAI.” On April 23, 2025, the last reported sale price of our common stock was \$1.25 per share as reported on the Nasdaq. We recommend that you obtain current market quotations for our common stock prior to making an investment decision. Our principal executive offices are located at 2515 McKinney Ave, Suite 1000, Dallas, TX. Our telephone number is (972) 499-4934. Our website is <https://investors.spectral-ai.com/>. The information found on, or otherwise accessible through, our website is not incorporated into, and does not form a part of, this prospectus or any other report or document we file with or furnish to the SEC.

We are an “emerging growth company” and a “smaller reporting company” under applicable federal securities laws and will be subject to reduced reporting requirements. This prospectus complies with the requirements that apply to an issuer that is an emerging growth company.

**You should carefully read this prospectus, any prospectus supplement relating to any specific offering of securities, and all information incorporated by reference herein and therein.**

**Investing in our securities involves a high degree of risk. These risks are discussed in this prospectus under “Risk Factors” beginning on page 6 and in the documents incorporated by reference in this prospectus.**

**Neither the Securities and Exchange Commission (the “SEC”) nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense.**

The date of this prospectus is \_\_\_\_\_, 2025

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## ABOUT THIS PROSPECTUS

This prospectus is part of the registration statement that we filed with the Securities and Exchange Commission (the “SEC”) pursuant to which the selling stockholders named in this prospectus may, from time to time, offer and sell or otherwise dispose of the shares of our common stock covered by this prospectus. As permitted by the rules and regulations of the SEC, the registration statement filed by us includes additional information not contained in this prospectus.

To the extent required under applicable law in connection with a particular offering of such securities by the selling stockholders, we or the selling stockholders will provide a prospectus supplement to this prospectus that contains specific information about the securities being offered and sold and the specific terms of that offering. To the extent permitted under applicable law, we and the selling stockholders may also authorize one or more free writing prospectuses that may contain material information relating to these offerings. Any such prospectus supplement or free writing prospectus may also add, update or change information contained in this prospectus with respect to that offering. If there is any inconsistency between the information in this prospectus and the applicable prospectus supplement or free writing prospectus, you should rely on the prospectus supplement or free writing prospectus, as applicable.

Neither we nor the selling stockholders have authorized anyone to provide you with any information or to make any representations other than those contained in this prospectus, any applicable prospectus supplement or any applicable free writing prospectuses prepared by or on behalf of us or to which we have referred you. Neither we nor the selling stockholders take any responsibility for, nor provide any assurance as to the reliability of, any other information that others may give you. Neither we nor the selling stockholders will make an offer to sell these securities in any jurisdiction where the offer or sale is not permitted.

We further note that the representations, warranties and covenants made by us in any agreement that is filed as an exhibit to any document that is incorporated by reference in this prospectus were made solely for the benefit of the parties to such agreement, including, in some cases, for the purpose of allocating risk among the parties to such agreements, and should not be deemed to be a representation, warranty or covenant to you. Moreover, such representations, warranties or covenants were accurate only as of the date when made. Accordingly, such representations, warranties and covenants should not be relied on as accurately representing the current state of our affairs.

You should read the entire prospectus and any prospectus supplement and any related issuer free writing prospectus, as well as the documents incorporated by reference into this prospectus or any prospectus supplement or any related issuer free writing prospectus, together with the additional information described under “Where You Can Find More Information,” before making an investment decision. You should also carefully consider, among other things, the matters discussed in the section entitled “Risk Factors” herein. Neither the delivery of this prospectus or any prospectus supplement or any issuer free writing prospectus nor any sale made hereunder shall under any circumstances imply that the information contained or incorporated by reference herein or in any prospectus supplement or issuer free writing prospectus is correct as of any date subsequent to the date hereof or of such prospectus supplement or issuer free writing prospectus, as applicable. You should assume that the information appearing in this prospectus, any prospectus supplement or any document incorporated by reference is accurate only as of the date of the applicable documents, regardless of the time of delivery of this prospectus or any sale of securities. Our business, financial condition, results of operations and prospects may have changed since that date.

This prospectus and the information incorporated herein by reference include trademarks, service marks and trade names owned by us or other companies. All trademarks, service marks and trade names included or incorporated by reference into this prospectus, any applicable prospectus supplement or any related free writing prospectus are the property of their respective owners.

**This prospectus contains forward-looking statements that are subject to a number of risks and uncertainties, many of which are beyond our control. See “Risk Factors” and “Cautionary Statement Regarding Forward Looking Statements” appearing in this prospectus and in the documents we file with the SEC that are incorporated by reference into this prospectus.**

## CAUTIONARY STATEMENT REGARDING FORWARD LOOKING STATEMENTS

This prospectus and the documents incorporated by reference herein contain forward-looking statements within the meaning of Section 27A of the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”). Any statements about our expectations, beliefs, plans, objectives, assumptions or future events or performance are not historical facts and may be forward-looking. These statements are often, but are not always, made through the use of words or phrases such as “anticipate,” “believe,” “contemplate,” “continue,” “could,” “estimate,” “expect,” “intend,” “may,” “plan,” “potential,” “predict,” “project,” “seek,” “should,” “target,” “will,” “would,” and similar expressions, or the negative of these terms, or similar expressions. Accordingly, these statements involve estimates, assumptions and uncertainties which could cause actual results to differ materially from those expressed in them. Any forward-looking statements are qualified in their entirety by reference to the factors discussed throughout this prospectus, and in particular those factors referenced in the section entitled “Risk Factors.”

The forward-looking statements contained in this prospectus are based on our current expectations and beliefs concerning future developments and their potential effects on us. There can be no assurance that future developments affecting us will be those that we have anticipated. These forward-looking statements involve a number of risks, uncertainties (some of which are beyond our control) or other assumptions that may cause actual results or performance to be materially different from those expressed or implied by these forward-looking statements. These risks and uncertainties include, but are not limited to, the following risks, uncertainties and other factors:

- We have incurred significant losses since inception and may not be able to achieve significant revenues or profitability.
- We are devoting substantially all of our efforts towards research and development of our DeepView System.
- We depend on government funding, which if lost or reduced, could have a material adverse effect on our research and development activities and our ability to commercialize our DeepView technology. Our largest contract is with the Biomedical Advanced Research and Development Authority (“BARDA”) and is the largest single source of revenue for us. Our BARDA contract is not guaranteed to be completed or extended.
- The regulatory review process is expensive, time-consuming, and uncertain and we may be unable to obtain clearance, approval, De Novo classification, or certification for our DeepView technology.
- We are highly dependent on our senior management, directors and key personnel, and our business could be harmed if we are unable to attract and retain personnel necessary for our success.
- We may experience significant delays in completing clinical trials, which could prevent or significantly delay our targeted product launch timeframe and impair our viability and business plan.
- New legislation and regulations and legislative and regulatory reforms may make it more difficult and costly for us to obtain regulatory clearance, approval, De Novo classification, or certification of our DeepView System, or to manufacture, market and distribute our device after clearance, approval, or classification is obtained.
- Disruptions at the FDA and foreign regulatory agencies caused by funding shortages or global health concerns could hinder their ability to hire and retain key leadership and other personnel, or otherwise prevent new products and services from being developed or commercialized in a timely manner, which could negatively impact our business.

- The ongoing labor shortage may limit our ability or the investigators' ability to find and retain medical staff that are needed to conduct the clinical studies.
- Modifications to our DeepView System may require new clearances, approvals, De Novo classifications, certifications, or new or amended certifications, and may require us to cease marketing or to recall the modified device until clearances, approvals, De Novo classifications, or the relevant certifications are obtained.
- Quality problems and product liability claims could lead to recalls or safety alerts, reputational harm, adverse verdicts or costly settlements, and could have a material adverse effect on our business, results of operations, financial condition, and cash flows.
- We must comply with anti-kickback, fraud and abuse, false claims, transparency, and other healthcare laws and regulations.
- If our manufacturers fail to comply with the regulatory quality system regulations or any applicable equivalent regulations, our proposed operations could be interrupted, and our operating results would suffer.
- Actual or perceived failure to comply with data protection, privacy and security laws, regulations, standards and other requirements could negatively affect our business, financial condition or results of operations.
- As the regulatory framework for AI technology evolves, our business, financial condition and results of operation may be adversely affected.
- If we are unable to establish sales, marketing and distribution capabilities either on our own or in collaboration with third parties, we may not be successful in commercializing our DeepView System, if approved.
- We may not be able to achieve or maintain satisfactory pricing and margins for our DeepView technology.
- We will depend upon third-party suppliers, including contract manufacturers and single and sole source suppliers, making us vulnerable to supply shortages and price fluctuations that could negatively affect our business, financial condition and results of operations.
- We may encounter difficulties in managing our growth, which could disrupt our operations.
- The use of artificial intelligence, including machine learning, in our analytics platforms may result in reputational harm or liability.
- Product liability suits, whether or not meritorious, could be brought against us due to an alleged defective product or for the misuse of our DeepView System. These suits could result in expensive and time-consuming litigation, payment of substantial damages, and an increase in our insurance rates.
- The success of our algorithms depends on our significant repository of proprietary data.

- Changes in patent law or its interpretation could diminish the value of patents in general, thereby impairing our ability to protect our existing and future products.
- Our patent rights and other intellectual property may be subject to priority, ownership or inventorship disputes, interferences, and similar proceedings and we may not be able to enforce our intellectual property rights throughout the world.
- Nasdaq may delist our securities from trading on its exchange, which could limit investors' ability to make transactions in our securities and subject us to additional trading restrictions.
- We will incur increased costs as a result of operating as a public company, and the Company's management will be required to devote substantial time to new compliance and investor relations initiatives.
- The price of our common stock may be volatile.
- Changes in laws, regulations or rules, or a failure to comply with any laws, regulations or rules, may adversely affect our business, investments and results of operations.
- If we fail to maintain proper and effective internal controls over financial reporting, our ability to produce accurate and timely financial statements could be impaired, investors may lose confidence in our financial reporting and the trading price of our common stock may decline.
- Certain existing stockholders purchased, or may purchase, securities in the Company at a price below the current trading price of such securities and may experience a positive rate of return based on the current trading price. Future investors in the Company may not experience a similar rate of return.
- Warrants may become exercisable for common stock, which would increase the number of shares eligible for resale in the public market and result in dilution to our stockholders.

We have included important factors in the cautionary statements included in this prospectus and the documents we incorporate by reference herein and therein, particularly in the "Risk Factors" section of our Annual Report on Form 10-K for the fiscal year ended December 31, 2024 (the "Annual Report on Form 10-K"), that we believe could cause actual results or events to differ materially from the forward-looking statements that we make. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments we may make. No forward-looking statement is a guarantee of future performance.

You should read this prospectus, any related prospectus supplement and any related free-writing prospectus, and the documents incorporated by reference herein and therein completely and with the understanding that our actual future results, levels of activity, performance and events and circumstances may be materially different from what we expect. The forward-looking statements contained or incorporated by reference in this prospectus or any prospectus supplement herein and therein represent our views as of the date of this prospectus are expressly qualified in their entirety by this cautionary statement. We anticipate that subsequent events and developments will cause our views to change. However, while we may elect to update these forward-looking statements at some point in the future, we have no current intention of doing so except to the extent required by applicable law. You should, therefore, not rely on these forward-looking statements as representing our views as of any date subsequent to the date of this prospectus.

#### MARKET AND INDUSTRY DATA

This prospectus incorporates by reference, and any prospectus supplement or free writing prospectus may contain and incorporate by reference, market data and industry statistics and forecasts that are based on independent industry publications and other publicly available information. Although we believe these sources are reliable, neither we nor the selling stockholders guarantee the accuracy or completeness of this information and neither we nor the selling stockholders have independently verified this information. In addition, the market and industry data and forecasts that may be included or incorporated by reference in this prospectus, any prospectus supplement or any applicable free writing prospectus may involve estimates, assumptions and other risks and uncertainties and are subject to change based on various factors, including those discussed under the heading "Risk Factors" contained in this prospectus, any applicable prospectus supplement and any applicable free writing prospectus, and under similar headings in other documents that are incorporated by reference into this prospectus. Accordingly, investors should not place undue reliance on this information.

## PROSPECTUS SUMMARY

Unless the context otherwise requires, references to the “Company,” “Spectral,” “we,” “us,” “our” and similar terms refer to Spectral AI, Inc. and its subsidiaries.

### Overview

We are an artificial intelligence (“AI”) company focused on predictive medical diagnostics. We operate in one segment. Currently, we are devoting substantially all of our efforts towards research and development of our DeepView<sup>®</sup> System, an internally developed multi-spectral imaging device that has previously received FDA breakthrough device designation status for an earlier version. Given our recent receipt of the UKCA mark for burn indication on our DeepView<sup>®</sup> System, we expect to begin commercialization activities in the United Kingdom in 2025. Our DeepView<sup>®</sup> System uses proprietary algorithms to distinguish between damaged and healthy human tissue invisible to the naked eye, providing “Day One” healing assessments. DeepView’s output is specifically engineered to allow the physician to make a more accurate, timely and informed decision regarding the treatment of the patient’s wound. Our focus has been on the burn indication which is supported by the BARDA PBS contract.

For burn wounds, a non-healing assessment could aid the clinician in making an immediate and objective determination for appropriate candidates for surgery, as well as determining what specific areas of the burn wound will require excision and skin grafting. We have conducted three large clinical studies with multiple sites across the United States, enrolling 413 burn patients, including 329 adult and 84 pediatric patients. Through these studies, we were able to quantify the burn assessment accuracy in patients undergoing both surgical and non-surgical treatment. In December 2023, we initiated a pivotal clinical study seeking enrollment of 240 patients, including 180 adult and 60 pediatric patients through multiple sites across the United States in both burn center and emergency departments. By the end of 2024, the Company had completed the enrollment of the pivotal clinical study with 267 patients, including 146 at burn centers, and 121 at emergency departments across 22 sites across the United States. As part of the total 267 patients enrolled, 42 pediatric patients were included from burn centers and another 42 pediatric patients were included from emergency departments.

We have not generated any product revenue to date. We have received substantial support from the U.S. government for our DeepView<sup>®</sup> System’s application for burn wounds, particularly from the Biomedical Advanced Research and Development Authority (“BARDA”), which is part of the HHS Office of the Assistant Secretary for Preparedness and Response in the United States, established to aid in securing the United States from chemical, biological, radiological, and nuclear threats, as well as from pandemic influenza and emerging infectious diseases. In early 2025, BARDA is undergoing a reorganization where it will be merged with the Advanced Research Projects Agency for Health to create a new office, the Office of Healthy Futures. We have also received funding from the National Science Foundation (the “NSF”), the National Institute of Health (the “NIH”) and the Defense Health Agency (the “DHA”). Since 2013, we have received approximately \$281.0 million in funding awards from government contracts, primarily from BARDA, which accounts for \$272.9 million. This has allowed us to develop our technology and further our clinical trials.

In September 2023, we executed our third contract with BARDA for a multi-year Project BioShield (“PBS”) agreement, valued at up to approximately \$150.0 million (the “PBS BARDA Contract”). This multi-year contract includes an initial award of nearly \$54.9 million to support the clinical validation and FDA clearance of DeepView® for commercial marketing and distribution purposes, which we expect to continue through the first quarter of 2026. This contract funding is non-dilutive to our shareholders, and we believe it validates the important nature of our mission and technology.

In addition to our PBS BARDA Contract, we received a \$4.0 million grant award from the Medical Technology Enterprise Consortium (“MTEC”) in April 2023, which, building on prior awards from DHA, is to be used to support military battlefield burn evaluation via a handheld version of the DeepView® System (the “MTEC Agreement”). In August 2024, the MTEC award was increased to \$4.9 million and is currently intended to run through December 2025 with funding dependent on various milestones. In March 2024, we received an additional \$0.5 million award from the Defense Health Agency to further this development.

Once commercialized, we anticipate that the DeepView® System will have two revenue streams, a SaMD (software as a medical device) model, and an imaging device component. The SaMD model applies a SaaS (software as a service) treatment for the DeepView® System which will feature a software licensing fee that includes maintenance, image hosting, and access to algorithm updates. The proprietary imaging device accesses artificial intelligence algorithms and is a universal platform to house multiple clinical applications. Pricing for these components will be evaluated and strategically set per country and site-of-service for heightened customer adoption.

### **Purchase Agreements**

On March 21, 2025, we entered into the Purchase Agreements with the selling stockholders for the sale of an aggregate of 2,068,846 shares (the “Shares”) of the Company’s common stock, at an offering price of \$1.30 per Share. The sale and issuance of the Shares was made pursuant to the Company’s registration statement on Form S-3 (file number 333-282681) (the “Registration Statement”), filed with the Securities and Exchange Commission (the “SEC”) on October 16, 2024 and declared effective on October 31, 2024, and the Company’s prospectus supplement relating to the Offering, which was filed with the SEC on March 21, 2025, that forms part of the Registration Statement.

Additionally, in a concurrent private placement pursuant to the Purchase Agreements (the “Private Placement”), the Company agreed to sell to the Investors an aggregate of 2,068,846 Warrants to purchase shares of common stock at an exercise price of \$1.80 per share. The Warrants, along with the shares of common stock issuable upon the exercise of the Warrants, were offered pursuant to the exemptions provided in Section 4(a)(2) under the Securities Act of 1933, as amended (the “Securities Act”).

The Purchase Agreements contain customary representations, warranties and agreements by the Company and the Investors and customary conditions to closing. Under the Purchase Agreements, subject to certain exceptions, the Company has agreed not to (i) enter into any agreement to issue or announce the issuance or proposed issuance of any Common Stock or Common Stock Equivalents (as defined in the Purchase Agreements) in a financing transaction for a period of 180 days, (ii) file any registration statement or amendment or supplement thereto for a period of 180 days, or (iii) enter into any agreement to effect any issuance of common stock or Common Stock Equivalents (as defined in the Purchase Agreements) involving a Variable Rate Transaction (as defined in the Purchase Agreements) for a period of 180 days following the offering closing date. Notwithstanding the foregoing, the Company may issue shares of common stock or securities convertible or exercisable into shares of common stock resulting in net proceeds to the Company in an amount of no less than Seven Million Dollars (\$7,000,000) as part of the Tranche 2 Commitment (as defined in the Supplement) financing with Avenue. Additionally, the Purchase Agreements contain certain registration rights, pursuant to which we are filing this prospectus and the registration statement of which this prospectus forms a part.

The Warrants issued in connection with the Purchase Agreements are exercisable any time on or after March 20, 2025 (the “Issuance Date”) and on or prior to the close of business on the third anniversary of the Issuance Date. Additionally, the Warrants issued in connection with the Purchase Agreements contain adjustment provisions in the event of (i) stock dividends and split, (ii) reclassifications of securities, (iii) issuance of Common Stock or Common Stock Equivalents (as defined in the Purchase Agreements), (iv) pro rata distributions, (v) Fundamental Transactions (as defined in the Warrants), and (vi) subsequent equity sales of shares of common stock or common stock equivalents for a consideration per share less than a price equal to \$1.30. The Warrants issued in connection with the Purchase Agreements also include a “Most Favored Nation” clause which grants the holders of such Warrants the right, in their sole discretion, to elect to receive more favorable terms and conditions given to a subsequent investor in a subsequent financing transaction (including, but not limited to, a lower purchase price per share, a higher warrant coverage percentage, a lower warrant exercise price, a longer warrant exercise period, more favorable anti-dilution protections, preferential liquidation rights, enhanced voting rights, reduced fees or commissions, more advantageous registration rights, or the inclusion of additional incentives such as cash bonuses, dividend preferences, or equity sweeteners).

On March 21, 2025, we entered into the LSA and (ii) a Supplement to Loan and Security Agreement (the “Supplement”), by and among the us, Spectral MD Holdings LLC, Spectral MD, Inc. and Avenue. Pursuant to the LSA and Supplement, the Company has the ability to borrow up to \$15.0 million in debt financing from Avenue with an initial draw down of \$8.5 million (such transaction, the “Debt Financing”).

The loan(s) under the LSA mature on March 1, 2028, with an interest-only payment period of no less than 15 months, which can be extended to 24 months upon the achievement of certain milestones prior to the end of such 15 month period as described in the Tranche 2 Milestone Date (as defined in the Supplement). The Tranche 2 Commitment (as defined in the Supplement) includes an additional \$6.5 million in debt financing and is contingent upon, among other things, (i) the granting by the U.S. Food and Drug Administration of the Company’s De Novo request for the Company’s DeepView System and (ii) an additional \$7.0 million equity raise to be completed by the Company.

The Debt Financing also included warrant coverage equal to 8.5% of the total funding commitment from Avenue, with an exercise price equal to the lower of (i) average of the daily volume weighted average price of common stock as reported for each of five (5) consecutive trading days, determined as of the end of the trading on the last trading day before the date of issuance, which was \$1.66 per share of common stock and (ii) the lowest price per share paid to the Company by cash investors for common stock issued in any sale of common stock in a bona-fide equity raising that closes at any time commencing from March 21, 2025 through (but excluding) December 31, 2025. Additionally, the Warrants issued in connection with the Debt Financing contain adjustment provisions in the event of (i) a subdivision or combination of stock, (ii) dividends, or (iii) change of control.

#### **Corporate Information**

On September 12, 2023, following completion of the Company’s business combination with Rosecliff Acquisition Corp I, the Company began trading its shares of the Company Common Stock and the Public Warrants on the Nasdaq Global Market (the “Nasdaq”) under the symbols “MDAI” and “MDAIW”, respectively.

Our principal executive offices are located at 2515 McKinney Ave, Suite 1000, Dallas, TX. Our telephone number is (972) 499-4934. Our website is <https://investors.spectral-ai.com/>. The information found on, or otherwise accessible through, our website is not incorporated into, and does not form a part of, this prospectus or any other report or document we file with or furnish to the SEC. We have included our website address in this prospectus solely as an inactive textual reference.

## **Implications of Being an Emerging Growth Company and Smaller Reporting Company**

We are an emerging growth company, as defined in the JOBS Act. The JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. This provision allows an emerging growth company to delay the adoption of some accounting standards until those standards would otherwise apply to private companies. We have elected to use the extended transition period under the JOBS Act for the adoption of certain accounting standards until the earlier of the date we (i) are no longer an emerging growth company or (ii) affirmatively and irrevocably opt out of the extended transition period provided in the JOBS Act. As a result, our financial statements may not be comparable to companies that comply more promptly with new or revised accounting pronouncements as of public company effective dates.

In addition, as an emerging growth company, we may take advantage of specified reduced disclosure and other requirements that are otherwise applicable generally to public companies. These provisions include:

- being permitted to present only two years of audited consolidated financial statements in addition to any required unaudited interim consolidated financial statements, with correspondingly reduced disclosure in the section titled “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in this prospectus;
- an exception from compliance with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, as amended;
- reduced disclosure about our executive compensation arrangements in our periodic reports, proxy statements and registration statements;
- exemptions from the requirements of holding non-binding advisory votes on executive compensation or golden parachute arrangements; and

We may take advantage of these provisions until the last day of the fiscal year ending after the fifth anniversary of the Company’s initial public offering or such earlier time that we no longer qualify as an emerging growth company. We will cease to qualify as an emerging growth company on the date that is the earliest of: (i) December 31, 2026; (ii) the last day of the fiscal year in which we have more than \$1.235 billion in total annual gross revenues; (iii) the date on which we are deemed to be a “large accelerated filer” under the rules of the SEC, which means the market value of our common stock that is held by non-affiliates exceeds \$700.0 million as of the prior June 30th and we have been a public company for at least 12 months and have filed one annual report on Form 10-K; or (iv) the date on which we have issued more than \$1.0 billion of non-convertible debt over the prior three-year period. We may choose to take advantage of some but not all of these reduced reporting burdens. Accordingly, the information contained herein may be different than you might obtain from other public companies in which you hold equity interests.

We are also a “smaller reporting company.” If we are a smaller reporting company at the time we cease to be an emerging growth company, we may continue to rely on exemptions from certain disclosure requirements that are available to smaller reporting companies. Specifically, as a smaller reporting company, we may choose to present only the two most recent fiscal years of audited consolidated financial statements in our Annual Report on Form 10-K and, similar to emerging growth companies, smaller reporting companies have reduced disclosure obligations regarding executive compensation.

## **Litigation Matters**

The Company is not a party to any material legal proceedings or pending claims. The Company is aware of a material threatened claim that it believes is without merit. From time to time, the Company may be subject to various legal proceedings and claims that arise in the ordinary course of its business activities. To our knowledge, there is not any material legal proceeding threatened against any of our officers or directors in their corporate capacity.

## THE OFFERING

Shares of common stock offered by the selling stockholders	2,836,918 shares of common stock issuable upon exercise of the Warrants
Shares of common stock outstanding prior to the exercise of the Warrants	25,628,121 shares of common stock
Use of proceeds	We will not receive any proceeds from the sale of shares of common stock by the selling stockholders pursuant to this prospectus.
Dividend Policy	We have never declared or paid cash dividends on our common stock and do not anticipate paying any cash dividends in the foreseeable future but intend to retain our capital resources for reinvestment in our business.
Trading Market and Ticker Symbol for our common stock	“MDAI”
Risk Factors	Investing in our securities involves a high degree of risk. See “Risk Factors” beginning on page 6 of this prospectus and the section entitled “Risk Factors” in our Annual Report on Form 10-K and in any similar section contained in the applicable prospectus supplement and in any free writing prospectuses we have authorized for use in connection with a specific offering and under similar headings in the documents that are incorporated by reference into this prospectus.

The number of shares of common stock outstanding prior to the exercise of the Warrants as of April 23, 2025 excludes the following:

- 3,517,958 shares of our common stock issuable upon the exercise of outstanding stock options at a weighted average exercise price of \$1.75 per share;
- 11,344,229 shares of common stock with a weighted average exercise price of \$2.54 per share, included in the Warrants;
- 169,400 shares of our common stock issuable upon vesting of restricted stock units issued under our equity incentive plan.

Unless otherwise indicated, this prospectus supplement reflects and assumes no exercise of outstanding options or warrants.

## RISK FACTORS

Investing in our securities involves a high degree of risk. In addition to the other information contained in this prospectus and in the documents we incorporate by reference, you should carefully consider the specific factors discussed under the heading “Risk Factors” in the applicable prospectus supplement, together with all of the other information contained or incorporated by reference in the prospectus supplement or appearing or incorporated by reference in this prospectus. You should also consider the risks, uncertainties and assumptions discussed under Item 1A, “Risk Factors,” in our Annual Report on Form 10-K or any updates in our Quarterly Reports on Form 10-Q, together with all other information appearing in or incorporated by reference into this prospectus or the applicable prospectus supplement, before deciding whether to purchase any securities being offered. The risks and uncertainties discussed in the foregoing are not the only ones facing us. Additional risks and uncertainties not presently known to us, or that we currently see as immaterial, may also harm our business. Past financial performance may not be a reliable indicator of future performance, and historical trends should not be used to anticipate results or trends in future periods. If any of these risks occur, our business, business prospects, financial condition or results of operations could be seriously harmed. This could cause the trading price of our common stock to decline, resulting in a loss of all or part of your investment. Please also read carefully the section above entitled “Cautionary Statement Regarding Forward-Looking Statements.”

## USE OF PROCEEDS

All of the shares of common stock offered by the selling stockholders pursuant to this prospectus will be sold by the selling stockholders for their respective accounts. We will not receive any of the proceeds from these sales.

The selling stockholders will pay any underwriting fees, discounts, selling commissions, stock transfer taxes and certain legal expenses incurred by such selling stockholders in disposing of their shares of common stock and we will bear all other costs, fees and expenses incurred in effecting the registration of such securities covered by this prospectus, including, without limitation, all registration and filing fees, Nasdaq listing fees and fees and expenses of our counsel and our independent registered public accountants.

## DESCRIPTION OF SECURITIES

The following description sets forth certain material terms and provisions of our securities that we may offer under this prospectus but is not complete. This description also summarizes relevant provisions of Delaware General Corporation Law (the “DGCL”). The following summary does not purport to be complete and is subject to, and is qualified in its entirety by reference to, the applicable provisions of the DGCL, our Charter and our Bylaws, copies of which are incorporated by reference as an exhibit to our Annual Report on Form 10-K. In addition, you should be aware that the summary below does not give full effect to the terms of the provisions of statutory or common law, and we encourage you to read our Charter, our Bylaws, and the applicable provisions of Delaware law for additional information.

The Charter authorizes the issuance of 81,000,000 shares of capital stock of the Company, consisting of (i) 80,000,000 shares of common stock, and (ii) 1,000,000 shares of preferred stock, par value \$0.0001 per share (the “preferred stock”). As of April 23, 2025, there were 25,628,121 shares of our common stock issued and outstanding and no shares of preferred stock issued and outstanding. The authorized and unissued shares of common stock and the authorized and undesignated shares of preferred stock are available for issuance without further action by our stockholders, unless such action is required by applicable law or the rules of any stock exchange on which our securities may be listed. Unless approval of our stockholders is so required, our board of directors does not intend to seek stockholder approval for the issuance and sale of our common stock or preferred stock.

### **Common Stock**

Holders of our common stock are entitled to one vote for each share held on all matters submitted to a vote of stockholders and have no cumulative voting rights. Holders of our common stock are entitled to receive ratably dividends as may be declared by our board of directors out of funds legally available for that purpose, subject to any preferential dividend or other rights of any then outstanding preferred stock. We have never paid cash dividends on our common stock and do not anticipate paying any cash dividends in the foreseeable future but intend to retain our capital resources for reinvestment in our business. Any future disposition of dividends will be at the discretion of our board of directors and will depend upon, among other things, our future earnings, operating and financial condition, capital requirements, and other factors.

Holders of our common stock do not have preemptive or conversion rights or other subscription rights. On the liquidation, dissolution, distribution of assets or winding up of the Company, each holder of common stock will be entitled, pro rata on a per share basis, to all assets of the Company of whatever kind available for distribution to the holders of common stock, subject to the designations, preferences, limitations, restrictions and relative rights of any preferred stock then outstanding. The rights, preferences and privileges of holders of common stock are subject to and may be adversely affected by the rights of the holders of shares of any series of our preferred stock that we may designate and issue in the future.

Holders of common stock are entitled to cast one vote per share of common stock on all matters to be voted on by stockholders. Holders of common stock will vote together as a single class, and an action will be approved by stockholders if the number of votes cast in favor of the action exceeds the number of votes cast in opposition to the action, while directors will be elected by a plurality of the votes cast. Holders of common stock are not entitled to cumulate their votes in the election of directors. When a quorum is present at any meeting, any matter other than the election of directors to be voted upon by the stockholders at such meeting will be decided by a majority vote of the holders of shares of capital stock present or represented at the meeting and voting affirmatively or negatively on such matter. At all meetings of stockholders for the election of directors at which a quorum is present, a plurality of the votes cast will be sufficient to elect such directors.

## Warrants

We may issue Warrants to purchase our securities or other rights, including rights to receive payment in cash or securities based on the value, rate or price of one or more specified commodities, currencies, securities or indices, or any combination of the foregoing. Warrants may be issued independently or together with any other securities that may be sold by us pursuant to this prospectus or any combination of the foregoing and may be attached to, or separate from, such securities. To the extent Warrants that we issue are to be publicly-traded, each series of such Warrants will be issued under a separate warrant agreement to be entered into between us and a warrant agent.

We will file as exhibits to the registration statement of which this prospectus is a part, or will incorporate by reference from a current report on Form 8-K that we file with the Commission, forms of the Warrant and warrant agreement, if any. The prospectus supplement relating to any Warrants that we may offer will contain the specific terms of the warrants and a description of the material provisions of the applicable warrant agreement, if any. These terms may include the following:

- the title of the Warrants;
- the aggregate number of Warrants;
- the price or prices at which the Warrants will be offered;
- the designation, amount and terms of the securities or other rights for which the Warrants are exercisable;
- the designation and terms of the other securities, if any, with which the Warrants are to be issued and the number of Warrants issued with each other security;
- if applicable, the date on and after which the Warrants and the related securities will be separately transferable;
- the price or prices at which the securities or other rights purchasable upon exercise of the Warrants may be purchased;
- any provisions for adjustment of the number or amount of securities receivable upon exercise of the Warrants or the exercise price of the Warrants;
- the manner of exercise of the Warrants, including any cashless exercise rights;
- the terms of any rights of us to redeem or call the Warrants;
- the identities of any warrant agent and any calculation or other agent for the Warrants;
- a discussion of any material U.S. federal income tax considerations applicable to the exercise of the Warrants;
- the date on which the right to exercise the Warrants will commence, and the date on which the right will expire;
- If any, the maximum or minimum number of Warrants that may be exercised at any time;
- information with respect to book-entry procedures, if any; and
- any other terms of the Warrants, including terms, procedures and limitations relating to the exchange and exercise of the Warrants.

*Exercise of Warrants.* Each Warrant will entitle the holder of Warrants to purchase the amount of securities or other rights, at the exercise price stated or determinable in the Warrants. Warrants may be exercised at any time up to the close of business on the expiration date shown in the applicable prospectus supplement, unless otherwise specified in such prospectus supplement. After the close of business on the expiration date, if applicable, unexercised Warrants will become void. Warrants may be exercised in the manner described in the applicable prospectus supplement. When the Warrant holder makes the payment and properly completes and signs the warrant certificate at the corporate trust office of the warrant agent, if any, or any other office indicated in the prospectus supplement, we will, as soon as possible, forward the securities or other rights that the warrant holder has purchased. If the warrant holder exercises less than all of the Warrants represented by the warrant certificate, we will issue a new warrant certificate for the remaining Warrants.

*Enforceability of Rights By Holders of Warrants.* Any warrant agent will act solely as our agent under the applicable warrant agreement and will not assume any obligation or relationship of agency or trust with any holder of any Warrant. A single bank or trust company may act as warrant agent for more than one issue of Warrants. A warrant agent will have no duty or responsibility in case of any default by us under the applicable warrant agreement or Warrant, including any duty or responsibility to initiate any proceedings at law or otherwise, or to make any demand upon us. Any holder of a Warrant may, without the consent of the related warrant agent or the holder of any other Warrant, enforce by appropriate legal action the holder's right to exercise, and receive the securities purchasable upon exercise of, its Warrants in accordance with their terms.

*Warrant Agreement Will Not Be Qualified Under Trust Indenture Act.* No warrant agreement will be qualified as an indenture, and no warrant agent will be required to qualify as a trustee, under the Trust Indenture Act. Therefore, holders of Warrants issued under a warrant agreement will not have the protection of the Trust Indenture Act with respect to their Warrants.

### **Outstanding Warrants**

As of April 23, 2025, including the Warrants, we had outstanding warrants to purchase 11,344,229 shares of common stock with a weighted average exercise price of \$2.54 per share, all of which are currently exercisable.

### **Anti-Takeover Effects of Certain Provisions of the DGCL, our Charter and Bylaws**

Section 203 of the DGCL affords us certain protections, such as prohibiting us from engaging in any business combination with any stockholder for a period of three years following the time that such stockholder (the "interested stockholder") came to own at least 15% of our outstanding voting stock (the "acquisition"), except if:

- our board of directors approved the acquisition prior to its consummation;
- the interested stockholder owned at least 85% of the outstanding voting stock upon consummation of the acquisition; or
- the business combination is approved by our board of directors, and by a two-thirds vote of the other stockholders in a meeting.

Generally, a "business combination" includes any merger, consolidation, asset or stock sale, or certain other transactions resulting in a financial benefit to the interested stockholder. Subject to certain exceptions, an "interested stockholder" is a person who, together with that person's affiliates and associates, owns, or within the previous three years owned, 15% or more of our voting stock.

Under certain circumstances, these anti-takeover provisions will make it more difficult for a person who would be an "interested stockholder" to effect various business combinations with us for a three-year period. This may encourage companies interested in acquiring us to negotiate in advance with our board of directors because the stockholder approval requirement would be avoided if our board of directors approves the acquisition that results in the stockholder becoming an interested stockholder.

This may also have the effect of preventing changes in our board of directors and may make it more difficult to accomplish transactions that stockholders may otherwise deem to be in their best interests.

### **Exclusive Forum**

The Charter provides that, unless the Company consents in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware (the "Chancery Court") shall be the sole and exclusive forum for any stockholder (including a beneficial owner) to bring: (i) any derivative action or proceeding brought on the Company's behalf; (ii) any action, suit or proceeding asserting a claim of breach of fiduciary duty owed by any current or former director, officer or other employee, agent or stockholder of the Company to the Company or its stockholders; (iii) any action, suit or proceeding asserting a claim against the Company, its current or former directors, officers, or employees, agents or stockholders arising pursuant to any provision of the DGCL, the Charter or the Bylaws or (iv) any action, suit or proceeding asserting a claim against the Company, its current or former directors, officers, or employees, agents or stockholders governed by the internal affairs doctrine, and, if such action is filed in a court other than the Chancery Court (a "Foreign Action") by any stockholder (including any beneficial owner), to the fullest extent permitted by law, such stockholder shall be deemed to have consented to (a) the personal jurisdiction of the Chancery Court in connection with any action brought in any such court; and (b) having service of process made upon such stockholder in any such action by service upon such stockholder's counsel in the Foreign Action as agent for such stockholder.

The exclusive forum provision set forth above does not apply to, and does not preclude or contract the scope of, either (i) exclusive federal jurisdiction pursuant to Section 27 of the Securities and Exchange Act for claims seeking to enforce any liability or duty created by the Securities and Exchange Act or the rules and regulations thereunder, or any other claim for which the U.S. federal courts have exclusive jurisdiction, or (ii) concurrent jurisdiction under Section 22 of the Securities Act for federal and state courts over all claims seeking to enforce any liability or duty created by the Securities Act or the rules and regulations thereunder.

#### **Potential Effects of Authorized but Unissued Stock**

The Charter provides that certain shares of authorized but unissued common stock and preferred stock will be available for future issuances without stockholder approval and could be utilized for a variety of corporate purposes, including future public offerings, to raise additional capital, or to facilitate acquisitions. The existence of authorized but unissued and unreserved common stock and preferred stock could make more difficult or discourage an attempt to obtain control of the Company by means of a proxy contest, tender offer, merger, or otherwise.

#### **Limitations of Director Liability and Indemnification of Directors, Officers and Employees**

The DGCL authorizes corporations to limit or eliminate the personal liability of directors or officers of corporations and their stockholders for monetary damages for breaches of directors' or officers' fiduciary duties, subject to certain exceptions. The Charter includes a provision that eliminates the personal liability of directors or officers for monetary damages for any breach of fiduciary duty as a director or officer except to the extent such exemption from liability or limitation thereof is not permitted under the DGCL as the same exists or may hereafter be amended.

The Bylaws provide that the Company must indemnify and hold harmless the directors and officers of the Company to the fullest extent authorized by the DGCL. The Company may purchase and maintain insurance on behalf of any person who is or was a director, officer, employee or agent of the Company, or is or was serving at the request of the Company as a director, officer, employee or agent of another corporation, partnership, joint venture, trust enterprise or non-profit entity against any liability asserted against him or her and incurred by him or her in any such capacity, or arising out of his or her status as such, whether or not the Company would have the power to indemnify him or her against such liability under the provisions of the DGCL.

The limitation of liability, advancement and indemnification provisions in the Charter and Bylaws may discourage stockholders from bringing lawsuits against directors or officers for breach of their fiduciary duties. These provisions also may have the effect of reducing the likelihood of derivative litigation against directors and officers, even though such an action, if successful, might otherwise benefit the Company and its stockholders. In addition, your investment may be adversely affected to the extent the Company pays the costs of settlement and damage awards against directors and officers pursuant to these indemnification provisions. See below for a further explanation of our director and officer limitations on liability and indemnification.

#### **Listing**

Our common stock is listed on Nasdaq under the symbol "MDAI" and our publicly traded Warrants are listed under the symbol "MDAIW".

#### **Transfer Agent and Registrar**

The Transfer Agent and Registrar for our common stock and warrants is Continental Stock Transfer & Trust Company.

## SELLING STOCKHOLDERS

This prospectus relates to the resale by the selling stockholders, from time to time, of an aggregate of up to 2,836,918 shares of our common stock issuable upon exercise of the Warrants, as described under “Prospectus Summary; Purchase Agreements.” The selling stockholders may from time to time offer and sell any or all of the shares of common stock set forth below pursuant to this prospectus and any accompanying prospectus supplement. When we refer to the “selling stockholders” in this prospectus, we mean the persons listed in the table below, and the donees, pledgees, transferees, assignees, designees, distributees or other successors-in-interest who later come to hold any of the selling stockholders’ interest in the common stock other than through a public sale.

The following table sets forth, as of the date of this prospectus, the names of the selling stockholders, certain beneficial ownership information with respect to the selling stockholders, and the aggregate number of shares of common stock that the selling stockholders may offer pursuant to this prospectus. This table was prepared based on information provided to us by the selling stockholders, and it is possible that certain of such selling stockholders may have sold, transferred or otherwise disposed of some or all of the securities shown below subsequent to the date as of which they provided such information.

Beneficial ownership is determined according to the rules of the SEC, which generally provide that a person has beneficial ownership of a security if such person possesses sole or shared voting or investment power over that security. Under those rules, beneficial ownership includes securities that the individual or entity has the right to acquire, such as through the conversion of convertible notes, within sixty (60) days following a specified date. The inclusion of any shares of common stock in this table does not constitute an admission of beneficial ownership for any selling stockholders named below.

Unless otherwise noted, the address for each beneficial owner listed below is c/o Spectral AI, Inc., 2515 McKinney Avenue, Suite 1000, Dallas, Texas 75201.

The number of shares of common stock and percentages of beneficial ownership set forth below are based on 28,465,039 shares of common stock issued and outstanding as of April 23, 2025, and assumes the full exercise of the Warrants for 2,836,918 shares of common stock.

<b>Name of Selling Stockholder</b>	<b>Shares Beneficially Owned Prior to the Offering</b>		<b>Shares Being Offered</b>	<b>Shares Beneficially Owned After the Offering</b>	
	<b>Shares</b>	<b>%</b>		<b>Shares</b>	<b>%</b>
Hamilton Stuart Capital Limited	192,308	0.7%	192,308	384,616	1.4%
Nicholas Maurice Slater	50,000	0.2%	50,000	100,000	0.4%
Phillip Chesterfield	30,000	0.1%	30,000	60,000	0.2%
Rupert King	100,000	0.3%	100,000	200,000	0.7%
Charles Stanley & Co Limited	40,000	0.2%	40,000	80,000	0.2%
Global Prime Partners Nominees Ltd.	400,000	1.4%	400,000	800,000	2.8%
Atom Capital Limited	57,692	0.2%	57,692	115,384	0.4%
Harrington Jenkins Group Ltd.	5,000	0.0%	5,000	10,000	0.0%
Vadim Alexandre	40,000	0.2%	40,000	80,000	0.2%
Titan Multi Strategy Fund I Ltd.	730,769	2.6%	730,769	1,461,538	5.1%
Kyle Wool	230,769	0.8%	230,769	461,538	1.6%
Harbour Holdings LLC	192,308	0.7%	192,308	384,616	1.4%
Avenue Venture Opportunities Fund II, L.P.	0	0.0%	768,072	768,072	2.7%
<b>Total Shares</b>	<b>2,068,846</b>		<b>2,836,918</b>	<b>4,905,764</b>	

We cannot advise you as to whether the selling stockholders will in fact sell any or all of the shares of common stock covered by this prospectus.

Selling stockholder information for each additional selling stockholder, if any, will be set forth by prospectus supplement to the extent required prior to the time of any offer or sale of such selling stockholder’s shares pursuant to this prospectus. To the extent permitted by law, a prospectus supplement may add, update, substitute, or change the information contained in this prospectus, including the identity of each selling stockholders and the number of shares of common stock registered on its behalf. A selling stockholder may sell or otherwise transfer all, some or none of such shares of common stock in this offering. See “Plan of Distribution.”

Other than as described above or elsewhere in this prospectus or the documents incorporated by reference herein, none of the selling stockholders have any material relationship with us or any of our predecessors or affiliates.

## PLAN OF DISTRIBUTION

The selling stockholders, which, as used herein, includes donees, pledgees, transferees, assignees, designees, distributees or other successors-in-interest selling shares of our common stock or interests in our common stock received after the date of this prospectus from the selling stockholders as a gift, pledge, partnership distribution or other transfer, may, from time to time, sell, transfer, distribute or otherwise dispose of certain of their shares of common stock or interests in our common stock on any stock exchange, market or trading facility on which shares of our common stock, as applicable, are traded or in private transactions. These dispositions may be at fixed prices, at prevailing market prices at the time of sale, at prices related to the prevailing market price, at varying prices determined at the time of sale, or at negotiated prices.

The selling stockholders may use any one or more of the following methods when disposing of their shares of common stock or interests therein:

- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- one or more underwritten offerings;
- block trades in which the broker-dealer will attempt to sell the shares of common stock as agent, but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its own account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- distributions to their members, partners or shareholders;
- short sales effected after the date of the registration statement of which this prospectus is a part is declared effective by the SEC;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- in market transactions, including transactions on a national securities exchange or quotations service or over-the-counter market;
- directly to one or more purchasers;
- through agents;
- broker-dealers may agree with the selling stockholders to sell a specified number of such shares of common stock at a stipulated price per share;
- through loans or pledges of the shares, including to a broker-dealer or an affiliate thereof;
- any other method permitted pursuant to applicable law; and
- a combination of any such methods of sale.

The selling stockholders may, from time to time, pledge or grant a security interest in some shares of our common stock owned by them and, if a selling stockholders defaults in the performance of its secured obligations, the pledgees or secured parties may offer and sell such shares of common stock, as applicable, from time to time, under this prospectus, or under an amendment or supplement to this prospectus amending the list of the selling stockholders to include the pledgee, transferee or other successors in interest as the selling stockholders under this prospectus. The selling stockholders also may transfer shares of our common stock in other circumstances, in which case the transferees, pledgees or other successors-in-interest will be the selling beneficial owners for purposes of this prospectus.

In connection with the sale of shares of our common stock or interests therein, the selling stockholders may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales of our common stock in the course of hedging the positions they assume. The selling stockholders may also sell shares of our common stock short and deliver these securities to close out their short positions, or loan or pledge shares of our common stock to broker-dealers that in turn may sell these securities. The selling stockholders may also enter into option or other transactions with broker-dealers or other financial institutions or the creation of one or more derivative securities that require the delivery to such broker-dealer or other financial institution of shares of our common stock offered by this prospectus, which shares such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction).

The aggregate proceeds to the selling stockholders from the sale of shares of our common stock offered by them will be the purchase price of such shares of our common stock less discounts or commissions, if any. The selling stockholders reserve the right to accept and, together with their agents from time to time, to reject, in whole or in part, any proposed purchase of shares of our common stock to be made directly or through agents. We will not receive any of the proceeds from any offering by the selling stockholders.

The selling stockholders also may in the future resell a portion of our common stock in open market transactions in reliance upon Rule 144 under the Securities Act, provided that they meet the criteria and conform to the requirements of that rule, or pursuant to other available exemptions from the registration requirements of the Securities Act.

The selling stockholders and any underwriters, broker-dealers or agents that participate in the sale of shares of our common stock or interests therein may be “underwriters” within the meaning of Section 2(a)(11) of the Securities Act. Any discounts, commissions, concessions or profit they earn on any resale of shares of our common stock may be underwriting discounts and commissions under the Securities Act. If any selling stockholder is an “underwriter” within the meaning of Section 2(a)(11) of the Securities Act, then the selling stockholders will be subject to the prospectus delivery requirements of the Securities Act. Underwriters and their controlling persons, dealers and agents may be entitled, under agreements entered into with us and the selling stockholders, to indemnification against and contribution toward specific civil liabilities, including liabilities under the Securities Act.

To the extent required, at the time a particular offer is made, the number of shares of our common stock being offered and the terms of the offering, including the name of any underwriter, dealer or agent, the respective purchase prices and public offering prices, and any applicable discounts, commissions, concessions or other compensation with respect to such offer will be set forth in an accompanying prospectus supplement or, if appropriate, a post-effective amendment to the registration statement that includes this prospectus.

To facilitate the offering of shares of our common stock offered by the selling stockholders, certain persons participating in the offering may engage in transactions that stabilize, maintain or otherwise affect the price of our common stock. This may include over-allotments or short sales, which involve the sale by persons participating in the offering of more shares of common stock than were sold to them. In these circumstances, these persons would cover such over-allotments or short positions by making purchases in the open market or by exercising their over-allotment option, if any. In addition, these persons may stabilize or maintain the price of our common stock by bidding for or purchasing shares of common stock in the open market or by imposing penalty bids, whereby selling concessions allowed to dealers participating in the offering may be reclaimed if shares of common stock sold by them are repurchased in connection with stabilization transactions. The effect of these transactions may be to stabilize or maintain the market price of our common stock at a level above that which might otherwise prevail in the open market. These transactions may be discontinued at any time.

Under the Purchase Agreements, we have agreed to indemnify the selling stockholders party thereto against certain liabilities that they may incur in connection with the sale of the securities registered hereunder, including liabilities under the Securities Act, and to contribute to payments that the selling stockholders may be required to make with respect thereto. In addition, we and the selling stockholders may agree to indemnify any underwriter, broker-dealer or agent against certain liabilities related to the selling of the securities, including liabilities arising under the Securities Act.

Under the Purchase Agreements, we have agreed to maintain the effectiveness of this registration statement until all securities registered pursuant thereto have been sold under this registration statement or Rule 144 under the Securities Act, are no longer outstanding, or otherwise cease to constitute registrable securities under the terms of such agreement. In addition, we have agreed to pay all expenses in connection with this offering, other than underwriting fees, discounts, selling commissions, stock transfer taxes and certain legal expenses. The selling stockholders will pay, on a pro rata basis, any underwriting fees, discounts, selling commissions, stock transfer taxes and certain legal expenses relating to the offering. Unless otherwise set forth in a prospectus supplement, the selling stockholders will receive all the net proceeds from the resale of shares of our common stock.

A selling stockholder that is an entity may elect to make an in-kind distribution of common stock to its members, partners or shareholders pursuant to the registration statement of which this prospectus is a part by delivering a prospectus. To the extent that such members, partners or shareholders are not affiliates of ours, such members, partners or shareholders would thereby receive freely tradable shares of common stock pursuant to the distribution through this registration statement.

We have agreed to pay all fees and expenses incident to the registration of shares of our common stock to be offered and sold pursuant to this prospectus.

## LEGAL MATTERS

The validity of the securities offered pursuant to this prospectus will be passed upon by Reed Smith LLP.

## EXPERTS

The consolidated financial statements of Spectral AI, Inc. as of December 31, 2024 and 2023 and for each of the years in the two-year period ended December 31, 2024, have been incorporated by reference herein in reliance upon the report of KPMG LLP, independent registered public accounting firm, incorporated by reference herein, and upon the authority of said firm as experts in accounting and auditing.

## WHERE YOU CAN FIND MORE INFORMATION

We are subject to the informational requirements of the Exchange Act, and in accordance therewith file annual, quarterly and current reports, proxy statements and other information with the SEC. The SEC maintains an internet website at [www.sec.gov](http://www.sec.gov) that contains periodic and current reports, proxy and information statements and other information regarding registrants that are filed electronically with the SEC.

These documents are also available, free of charge, through the Investors section of our website, which is located at <https://investors.spectral-ai.com/>.

We have filed with the SEC a registration statement under the Securities Act of 1933, as amended, relating to the offering of these securities. The registration statement, including the attached exhibits, contains additional relevant information about us and the securities. This prospectus does not contain all of the information set forth in the registration statement. You can obtain a copy of the registration statement for free at [www.sec.gov](http://www.sec.gov). The registration statement and the documents referred to below under “Incorporation of Documents by Reference” are also available on our website, <https://investors.spectral-ai.com/>. The reference to our website in this prospectus is an inactive textual reference only and is not a hyperlink. The contents of our website are not part of this prospectus, and you should not consider the contents of our website in making an investment decision with respect to our securities.

We have not incorporated by reference into this prospectus the information on our website, and you should not consider it to be a part of this prospectus.

## INFORMATION INCORPORATED BY REFERENCE

The SEC allows us to “incorporate by reference” the information we have filed with it, which means that we can disclose important information to you by referring you to those documents. The information we incorporate by reference is an important part of this prospectus, and later information that we file with the SEC will automatically update and supersede this information. We specifically are incorporating by reference the following documents filed with the SEC (excluding those portions of any Current Report on Form 8-K that are furnished and not deemed “filed” pursuant to the General Instructions of Form 8-K):

- our Annual Report on [Form 10-K](#) for the fiscal year ended December 31, 2024, filed with the SEC on March 31, 2025;
- our Quarterly Report on [Form 10-Q](#) for the fiscal quarter ended March 31, 2024, filed with the SEC on May 9, 2024, Quarterly Report on [Form 10-Q](#) for the fiscal quarter ended June 30, 2024, filed with the SEC on August 12, 2024, and Quarterly Report on [Form 10-Q](#) for the fiscal quarter ended September 30, 2024, filed with the SEC on November 6, 2024;
- our Current Reports on Form 8-K filed with the SEC on [February 2, 2024](#), [February 12, 2024](#), [March 1, 2024](#), [March 22, 2024](#), [April 2, 2024](#), [May 16, 2024](#), [June 5, 2024](#), [June 24, 2024](#), [July 15, 2024](#), [October 15, 2024](#), [December 11, 2024](#), [March 4, 2025](#), [March 4, 2025](#), [March 26, 2025](#) and [April 2, 2025](#) (other than any portions thereof deemed furnished and not filed);
- our Definitive Proxy Statement on [Schedule 14A](#), filed with the SEC on April 17, 2025 (but only with respect to information required by Part III of our Annual Report on Form 10-K for the year ended December 31, 2024, which information updated and superseded information included in Part III of our Annual Report on Form 10-K for the year ended December 31, 2024); and
- the description of our common stock contained in our [Form 10-K](#), filed with the Commission on March 31, 2025, and any amendment or report filed with the Commission for purposes of updating such description.

All reports and definitive proxor information statements subsequently filed after the date of this initial registration statement and prior to effectiveness of this registration statement by the Company pursuant to Sections 13(a), 13(c), 14 and 15(d) of the Exchange Act, but excluding information furnished to, rather than filed with, the SEC, shall be deemed to be incorporated by reference herein and to be a part hereof from the date such documents are filed.

Any statement contained herein or in any document incorporated or deemed to be incorporated by reference shall be deemed to be modified or superseded for purposes of the registration statement of which this prospectus forms a part to the extent that a statement contained in any other subsequently filed document which also is or is deemed to be incorporated by reference modifies or supersedes such statement. Any such statement so modified or superseded shall not be deemed to constitute a part of the registration statement of which this prospectus forms a part, except as so modified or superseded.

You should rely only on the information incorporated by reference or provided in this prospectus. We have not authorized anyone else to provide you with different information. You should not assume that the information in this prospectus is accurate as of any date other than the date of this prospectus or the date of the documents incorporated by reference in this prospectus.

We will provide without charge to each person to whom a copy of this prospectus is delivered, upon written or oral request, a copy of any or all of the information that has been incorporated by reference in this prospectus but not delivered with this prospectus (other than an exhibit to these filings, unless we have specifically incorporated that exhibit by reference in this prospectus). Any such request should be addressed to us at:

Spectral AI, Inc.  
Attn: Vincent S. Capone, Esq.  
Chief Financial Officer & General Counsel  
2515 McKinney Ave, Suite 1000  
Dallas, TX 75201  
972-499-4934

You may also access the documents incorporated by reference in this prospectus through our website at <https://investors.spectral-ai.com/>. Except for the specific incorporated documents listed above, no information available on or through our website shall be deemed to be incorporated in this prospectus or the registration statement of which it forms a part.



**Up to 2,836,918 shares of Common Stock**

PRELIMINARY PROSPECTUS

, 2025

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PART II  
INFORMATION NOT REQUIRED IN PROSPECTUS

**Item 14. Other Expenses of Issuance and Distribution.**

The following table sets forth the estimated costs and expenses payable by the registrant expected to be incurred in connection with the issuance and distribution of the securities being registered hereby (other than underwriting discounts and commissions). All of such expenses are estimates, except for the SEC registration fee.

	<b>Amount to be Paid</b>
SEC registration fee	\$ 551.60
Printing fees and expenses	*
Transfer agent and registrar fees	*
Accounting fees and expenses	*
Legal fees and expenses	*
Miscellaneous <sup>(1)</sup>	*
Total	<u>\$ *</u>

\* These fees are calculated based on the securities offered and the number of issuances and accordingly cannot be estimated at this time.

(1) Pursuant to the Purchase Agreements, the Company will pay the registration expenses, which are generally the fees and expenses associated with the registration and sale of the offered shares by the selling stockholders, except underwriting fees, discounts or commissions, any out-of-pocket expenses (other than fees and expenses incurred in connection with complying with state securities or blue sky laws) of the selling stockholders or the fees and disbursements of any underwriter.

**Item 15. Indemnification of Directors and Officers.**

Section 102 of the DGCL permits a corporation to eliminate the personal liability of directors of a corporation to the corporation or its stockholders for monetary damages for a breach of fiduciary duty as a director, except where the director breached his duty of loyalty, failed to act in good faith, engaged in intentional misconduct or knowingly violated a law, authorized the payment of a dividend or approved a stock repurchase in violation of Delaware corporate law or obtained an improper personal benefit. Our Charter provides that no director of the Registrant shall be personally liable to it or its stockholders for monetary damages for any breach of fiduciary duty as a director, notwithstanding any provision of law imposing such liability, except to the extent that the DGCL prohibits the elimination or limitation of liability of directors for breaches of fiduciary duty.

Section 145 of the DGCL provides that a corporation has the power to indemnify a director, officer, employee, or agent of the corporation, or a person serving at the request of the corporation for another corporation, partnership, joint venture, trust or other enterprise in related capacities against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by the person in connection with an action, suit or proceeding to which he was or is a party or is threatened to be made a party to any threatened, ending or completed action, suit or proceeding by reason of such position, if such person acted in good faith and in a manner he reasonably believed to be in or not opposed to the best interests of the corporation, and, in any criminal action or proceeding, had no reasonable cause to believe his conduct was unlawful, except that, in the case of actions brought by or in the right of the corporation, no indemnification shall be made with respect to any claim, issue or matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that the Delaware Court of Chancery or other adjudicating court determines that, despite the adjudication of liability but in view of all of the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which the Delaware Court of Chancery or such other court shall deem proper.

Our Charter provides that we will indemnify each person who was or is a party or threatened to be made a party to any threatened, pending or completed action, suit or proceeding (other than an action by or in the right of us) by reason of the fact that he or she is or was, or has agreed to become, a director or officer, or is or was serving, or has agreed to serve, at our request as a director, officer, partner, employee or trustee of, or in a similar capacity with, another corporation, partnership, joint venture, trust or other enterprise (all such persons being referred to as an "Indemnatee"), or by reason of any action alleged to have been taken or omitted in such capacity, against all expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred in connection with such action, suit or proceeding and any appeal therefrom, if such Indemnatee acted in good faith and in a manner he or she reasonably believed to be in, or not opposed to, our best interests, and, with respect to any criminal action or proceeding, he or she had no reasonable cause to believe his or her conduct was unlawful. Our Charter provides that we will indemnify any Indemnatee who was or is a party to an action or suit by or in the right of us to procure a judgment in our favor by reason of the fact that the Indemnatee is or was, or has agreed to become, a director or officer, or is or was serving, or has agreed to serve, at our request as a director, officer, partner, employee or trustee of, or in a similar capacity with, another corporation, partnership, joint venture, trust or other enterprise, or by reason of any action alleged to have been taken or omitted in such capacity, against all expenses (including attorneys' fees) and, to the extent permitted by law, amounts paid in settlement actually and reasonably incurred in connection with such action, suit or proceeding, and any appeal therefrom, if the Indemnatee acted in good faith and in a manner he or she reasonably believed to be in, or not opposed to, our best interests, except that no indemnification shall be made with respect to any claim, issue or matter as to which such person shall have been adjudged to be liable to us, unless a court determines that, despite such adjudication but in view of all of the circumstances, he or she is entitled to indemnification of such expenses. Notwithstanding the foregoing, to the extent that any Indemnatee has been successful, on the merits or otherwise, he or she will be indemnified by us against all expenses (including attorneys' fees) actually and reasonably incurred in connection therewith. Expenses must be advanced to an Indemnatee under certain circumstances.

We have entered into indemnification agreements with each of our directors and officers. These indemnification agreements may require us, among other things, to indemnify our directors and officers for some expenses, including attorneys' fees, judgments, fines and settlement amounts incurred by a director or officer in any action or proceeding arising out of his or her service as one of our directors or officers, or any of our subsidiaries or any other company or enterprise to which the person provides services at our request.

We maintain a general liability insurance policy that covers certain liabilities of directors and officers of our corporation arising out of claims based on acts or omissions in their capacities as directors or officers.

In any underwriting agreement we enter into in connection with the sale of common stock being registered hereby, the underwriters will agree to indemnify, under certain conditions, us, our directors, our officers and persons who control us within the meaning of the Securities Act against certain liabilities.

**Item 16. Exhibits.**

(a) Exhibits.

<b>Exhibit Number</b>	<b>Description of Document</b>
2.1	<a href="#">Business Combination Agreement, by and among Rosecliff Acquisition Corp I, Merger Sub I, Merger Sub II and Spectral MD Holdings, Ltd., dated as of April 11, 2023 (incorporated by reference to Annex A of the Registration Statement on Form S-4 (File No. 333-271566)).</a>
3.1	<a href="#">Second Amended and Restated Certificate of Incorporation of Spectral AI, Inc. (incorporated by reference to the Company's Current Report on Form 8-K, filed with the SEC on September 15, 2023).</a>
3.2	<a href="#">Amended and Restated Bylaws of Spectral AI, Inc. (incorporated by reference to the Company's Current Report on Form 8-K, filed with the SEC on September 15, 2023).</a>
4.1	<a href="#">Description of Securities (incorporated by reference to the Registrant's Annual Report on Form 10-K filed on March 31, 2022).</a>
4.2	<a href="#">Form of Securities Purchase Agreement, dated March 21, 2025, by and between Spectral AI, Inc. and various investors (incorporated by reference to the Registrants Current Report on Form 8-K filed on March 26, 2025).</a>
4.3	<a href="#">Form of Securities Purchase Agreement, dated March 21, 2025, by and between Dominari Securities, LLC and Spectral AI, Inc. (incorporated by reference to the Registrants Current Report on Form 8-K filed on March 26, 2025).</a>
4.4	<a href="#">Loan and Security Agreement, dated March 21, 2025, by and among Spectral AI, Inc., Spectral MD Holdings LLC, Spectral MD, Inc. and Avenue Venture Fund II, L.P. (incorporated by reference to the Registrants Current Report on Form 8-K filed on March 26, 2025).</a>
4.5	<a href="#">Form of Warrant (incorporated by reference to the Registrants Current Report on Form 8-K filed on March 26, 2025).</a>
4.6	<a href="#">Form of Avenue Warrant (incorporated by reference to the Registrants Current Report on Form 8-K filed on March 26, 2025).</a>
5.1*	<a href="#">Opinion of Reed Smith LLP</a>
23.1*	<a href="#">Consent of KPMG, LLP, independent registered public accounting firm</a>
23.2*	<a href="#">Consent of Reed Smith LLP (included in Exhibit 5.1)</a>
24.1*	<a href="#">Power of Attorney (included in Part II of this Registration Statement)</a>
107*	<a href="#">Filing Fee Table</a>

\* Filed herewith.

**Item 17. Undertakings.**

(a) The undersigned registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) to include any prospectus required by Section 10(a)(3) of the Securities Act of 1933;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) (§ 230.424(b) of this chapter) if, in the aggregate, the changes in volume and price represent no more than 20% change in the maximum aggregate offering price set forth in the "Calculation of Filing Fee Tables" or "Calculation of Registration Fee" table, as applicable, in the effective registration statement; and

(iii) to include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement;

*provided, however*, that paragraphs (1)(i), (1)(ii) and (1)(iii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the registrant pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in the registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of the registration statement.

(2) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(4) That, for the purpose of determining liability under the Securities Act of 1933 to any purchaser:

(i) If the registrant is relying on Rule 430B (§230.430B of this chapter):

(A) Each prospectus filed by the registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and

(B) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii), or (x) for the purpose of providing the information required by Section 10(a) of the Securities Act of 1933 shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof. *Provided, however*, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date.

(ii) If the registrant is subject to Rule 430C, each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering, other than registration statements relying on Rule 430B or other than prospectuses filed in reliance on Rule 430A, shall be deemed to be part of and included in the registration statement as of the date it is first used after effectiveness. *Provided, however,* that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such first use, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such date of first use.

(5) That, for the purpose of determining liability of the registrant under the Securities Act of 1933 to any purchaser in the initial distribution of the securities, the undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

(i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;

(ii) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;

(iii) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and

(iv) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

(b) The undersigned registrant hereby undertakes that, for purposes of determining any liability of the registrant under the Securities Act of 1933, each filing of the registrant's annual report pursuant to Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(c) Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act of 1933 and will be governed by the final adjudication of such issue.

(d) The undersigned registrant hereby undertakes that:

- (1) For purposes of determining any liability under the Securities Act of 1933, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed by the registrant pursuant to Rule 424(b) (1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective.
- (2) For the purpose of determining any liability under the Securities Act of 1933, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-3 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Dallas, State of Texas, on April 24, 2025.

**Spectral AI, Inc.**

By: /s/ J. Michael DiMaio

Name: J. Michael DiMaio

Title: Chairman (Principal Executive Officer)

POWER OF ATTORNEY

Each person whose signature appears below constitutes and appoints Vincent Capone, with full power to act alone and without the others, his true and lawful attorney-in-fact, with full power of substitution, and with the authority to execute in the name of each such person, any and all amendments (including without limitation, post-effective amendments) to this registration statement on Form S-3, to sign any and all additional registration statements relating to the same offering of securities as this registration statement that are filed pursuant to Rule 462(b) of the Securities Act of 1933, and to file such registration statements with the Securities and Exchange Commission, together with any exhibits thereto and other documents therewith, necessary or advisable to enable the registrant to comply with the Securities Act of 1933, and any rules, regulations and requirements of the Securities and Exchange Commission in respect thereof, which amendments may make such other changes in the registration statement as the aforesaid attorney-in-fact executing the same deems appropriate.

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ J. Michael DiMaio</u> J. Michael DiMaio	Chairman (Principal Executive Officer)	April 24, 2025
<u>/s/ Vincent S. Capone</u> Vincent S. Capone	Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	April 24, 2025
<u>/s/ Richard Cotton</u> Richard Cotton	Director	April 24, 2025
<u>/s/ Martin Mellish</u> Martin Mellish	Director	April 24, 2025
<u>/s/ Deepak Sadagopan</u> Deepak Sadagopan	Director	April 24, 2025
<u>/s/ Marion Snyder</u> Marion Snyder	Director	April 24, 2025
<u>/s/ Erich Spangenberg</u> Erich Spangenberg	Director	April 24, 2025



Reed Smith LLP  
599 Lexington Avenue  
New York, NY 10022-7650  
+1 212 521 5400  
Fax +1 212 521 5450  
reedsmith.com

April 24, 2025

Spectral AI, Inc.  
2515 McKinney Avenue, Suite 1000  
Dallas, Texas 75201

Ladies and Gentlemen:

We have acted as special counsel to Spectral AI, Inc., a Delaware corporation (the “**Company**”), in connection with the preparation and filing with the Securities and Exchange Commission (the “**Commission**”) of a Registration Statement on Form S-3 (the “**Registration Statement**”), under the Securities Act of 1933, as amended (the “**Securities Act**”), including the related Prospectus therein (the “**Prospectus**”), on April 23, 2025. The Registration Statement and the Prospectus relate to the offer and resale by the Selling Securityholders (as defined below) of 2,836,918 shares (the “**Shares**”) of the Company’s Class A common stock, par value \$0.0001 (“**Common Stock**”), issuable upon the exercise of warrants to acquire shares of Common Stock (“**Warrants**”) originally issued in private placements, which consists of (i) 768,072 Warrants with an exercise price of \$1.66 per Warrant issued to Avenue Ventures Fund II, L.P. (“**Avenue**”) pursuant to a Loan and Security Agreement, dated March 21, 2025, by and among the Company, Spectral MD Holdings LLC, Spectral MD, Inc. and Avenue (the “**LSA**”); (ii) 1,153,846 Warrants with an exercise price of \$1.80 per Warrant issued to certain investors in the United States (the “**US Investors**”) pursuant to a securities purchase agreement, dated March 21, 2025, by and between the Company and Dominari Securities LLC (the “**Dominari Purchase Agreement**”); and (iii) 915,000 Warrants with an exercise price of \$1.80 per Warrant issued to certain investors in the United Kingdom (the “**UK Investors**,” and together with Avenue and the US Investors, the “**Selling Securityholders**”) pursuant to a securities purchase agreement, dated March 21, 2025, by and among the Company and the UK Investors (the “**UK Purchase Agreement**” and, along with the LSA and Dominari Purchase Agreement, the “**Purchase Agreements**”).

This opinion letter is being furnished in accordance with the requirements of Item 601(b)(5) of Regulation S-K under the Securities Act.

We have reviewed originals or copies of (a) the Registration Statement, (b) the Prospectus, (c) executed copies of the Purchase Agreements, (d) the certificate of incorporation and bylaws of the Company, as amended through the date hereof, (e) the Warrants and (f) certain resolutions of the board of directors of the Company or committees thereof. We have also examined originals or copies, certified or otherwise identified to our satisfaction, of such documents, corporate records, certificates of public officials and other instruments as we have deemed necessary or advisable as a basis for the opinion set forth below.

In rendering the opinion set forth below, we have assumed the genuineness of all signatures, the legal capacity of natural persons, the authenticity of all items submitted to us as originals, the conformity with originals of all items submitted to us as copies, and the authenticity of the originals of such copies. As to any facts material to the opinions expressed herein, we have relied upon statements and representations of officers and other representatives of the Company and public officials. We have also assumed, with respect to the issuance of the Shares, the amount of valid consideration paid in respect of such Shares will equal or exceed the par value of such Shares. We have not independently established the validity of the foregoing assumptions.

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This opinion letter is limited to the federal laws of the United States of America, the laws of the State of New York and the Delaware General Corporation Law. We express no opinion, and make no statement, as to the laws, rules, or regulations of any other jurisdiction or as to the municipal laws or the laws, rules, or regulations of any local agencies or governmental authorities of or within the State of Delaware and New York, or as to any matters arising thereunder or relating thereto. We do not find it necessary for the purposes of this opinion letter to cover, and accordingly we express no opinion as to, the application of the securities or blue-sky laws of the various states to sales of the Shares.

Based on, and subject to the foregoing and the other limitations, qualifications, exceptions and assumptions set forth herein, we are of the opinion that the Shares were duly authorized, and if issued upon exercise of the Warrants, against payment therefor in accordance with the terms of the Warrants, will be validly issued, fully paid, and non-assessable.

The opinions set forth herein are given as of the date hereof, and we undertake no obligation to update or supplement this opinion letter if any applicable law changes after the date hereof or if we become aware of any fact or other circumstances that changes or may change our opinion set forth herein after the date hereof or for any other reason. We express no opinion, and make no statement, as to the applicability of any rights or obligations provided in the Purchase Agreements in future transactions.

We hereby consent to the filing of this opinion letter as Exhibit 5.1 to the Registration Statement and to the use of our name under the caption "Legal Matters" in the Prospectus forming part of the Registration Statement and any amendments thereto. In giving such consent, we do not hereby admit that we are within the category of persons whose consent is required under Section 7 of the Securities Act, and the rules and regulations of the Commission promulgated thereunder.

Very truly yours,

/s/ Reed Smith  
REED SMITH LLP

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KPMG LLP  
Suite 1400  
2323 Ross Avenue  
Dallas, TX 75201-2721

**Consent of Independent Registered Public Accounting Firm**

We consent to the use of our report dated March 31, 2025, with respect to the consolidated financial statements of Spectral AI, Inc., incorporated herein by reference, and to the reference to our firm under the heading "Experts" in the prospectus.

*KPMG LLP*

Dallas, Texas  
April 24, 2025

KPMG LLP, a Delaware limited liability partnership and a member firm of the KPMG global organization of independent member firms affiliated with KPMG International Limited, a private English company limited by guarantee.

**Calculation of Filing Fee Tables**

Form S-3  
(Form Type)

Spectral AI, Inc.  
(Exact Name of Registrant as Specified in its Charter)

Table 1: Newly Registered Securities

Security Type	Security Class Title	Fee Calculation Rule	Amount Registered <sup>(1)</sup>	Proposed Maximum Offering Price Per Unit	Maximum Aggregate Offering Price <sup>(3)</sup>	Fee Rate	Amount of Registration Fee
Equity	Common Stock	457(c)	2,836,918 <sup>(2)</sup>	N/A	\$ 3,602,886	\$ 0.00015310	\$ 551.60 <sup>(4)</sup>
Total Offering Amounts					\$ 3,602,886		\$ 551.60
Total Fee Offsets							—
Net Fee Due							\$ 551.60

- (1) In accordance with Rule 416 under the Securities Act of 1933, as amended, this registration statement shall be deemed to cover an indeterminate number of additional securities to be offered or issued from stock splits, stock dividends or similar transactions.
- (2) Represents up to 2,836,918 shares of common stock issuable in connection with the exercise of the Warrants.
- (3) Estimated solely for the purpose of calculating the registration fee, based on the average of the high and low prices of the Common Stock on the Nasdaq Stock Market LLC (“Nasdaq”) on April 23, 2025 (\$1.27 per share), in accordance with Rule 457(c) of the Securities Act.
- (4) Calculated pursuant to Rule 457 of the Securities Act by multiplying the proposed maximum aggregate offering price of securities to be registered by 0.00015310.