

Robots Picking Strawberries. Seriously. Hand-eye Coordination Software to transform the world.



l5automation.com La Cañada Flintridge, CA [in](#) Technology B2B Minority Founder AI Agriculture & Agtech

Highlights

- 1 We are picking strawberries out at REAL farms and have been paid to do it, starting this last season
- 2 We are generating cash TODAY, with >\$430k year to date in grants and services. \$850k target for 2024
- 3 Repeat Founder - Previously co-founded Astrobotic, company to launch to the Moon this Christmas
- 4 Over \$1.5 million raised, including from our client/partner GoodFarms (Strawberry Grower)
- 5 "Harvesting as a Service" Tech is patent pending, w/ backing from the National Science Foundation
- 6 Incredible team with deep experience in tech startups, robotics development and software engineering
- 7 Top notch advisors and investors with expertise in tech, agriculture, and legal
- 8 Technology will go way beyond farming, solving problems that have previously resisted automation

Featured Investors



Farmhand Ventures
Syndicate Lead

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Invested \$150,000 ⓘ

farmhandventures.com

"We invested in L5 Automation because they have a better way of automating strawberry harvest. Strawberries are a nutritious crop that can be profitably cultivated, but they're very difficult to pick. Today, strawberry harvesting is entirely manual, and as labor availability decreases and costs increase, it's becoming prohibitively expensive to cultivate strawberries and other soft fruits."

L5 is taking a unique approach towards strawberry harvesting with its 2-armed harvester. ”



Michaelah M

Follow

”I’m a culinary arts graduate who is greatly concerned about the farmers agin...

See more investor reviews



Other investors include [GoodFarms](#), [FarmHand Ventures](#), [National Science Foundation](#) & 193 more

Our Team



Alexander Gutierrez Founder & CEO

Graduate of Carnegie Mellon's Robotics Institute, Alex is a serial founder and family man. Prior to L5 Automation, he co-founded space company Astrobotic, raced robots for DARPA's Grand Challenge, and oversaw technology development for Lockheed Martin.



Dan Schneider Software Engineering Director

Dan has extensive experience with software systems development, successfully delivering complex, embedded, real-time and safety critical systems. He led ground breaking research resulting in peer review and publication. M.S. in Comp Sci from Stanford.



Edward Terry Robotics Research Engineer

A versatile engineer with a specialization in deploying object detection systems on mobile robots in unstructured environments. Ed worked at NASA JPL and KEF Robotics after graduating from Carnegie Mellon's Robotics Institute in 2018.



Bernardo Rocamora, Jr. Robotics Research Engineer

Ph.D. candidate in Robotics at West Virginia Univ. with a background in mechanical engineering. Bernardo worked as the manipulation lead, and system integration and autonomy co-lead for the WVU Robotics team in the NASA Space Robotics Challenge Phase-2.



Zoe Dina Harris Operations Manager

Zoe has been earning her degree at Pasadena City College while leading L5's field operations on various farms in Southern California. She also helped run our blueberry engagement with AgroVision in Peru and is our resident metal machinist.



Sarah Lozano Associate Software Engineer

Starting as a part time Software Intern, Sara now works as a full time engineer at L5 and helps bring the robotic iterations to life while taking college classes part-time.



Xiaoyu Zheng CFO

CFA holder and Portfolio Manager at Guggenheim Partners where he oversees quantitative multi-asset institutional strategies. He has over 15 years of experience in various roles in asset management in global macro research and quantitative analysis.



Edward Lopez Advisor

Ed Lopez, a seasoned professional with over 30 years in Silicon Valley as both an attorney and senior executive, currently advises firms on business matters. Most recently, he was a Principal at LopezAdela and CLO at Sakuu Corporation.



Derek Parham Advisor

Founding Engineer for Google Apps, a CTO, a startup-advisor and a technology advocate, Derek has been an early supporter, investor and advisor to L5 Automation.



Farmhand Ventures Advisor



Connie Bowen is the founding General Partner at Farmhand Ventures. She's an experienced AgriFoodTech venture investor previously with The Yield Lab and AgLaunch, and thought-leader, writing for outlets including Forbes and AgFunder News.

Come along on our journey

Enabling robotic automation to create a world of plenty

At L5 Automation Inc. we're getting robots out of highly controlled factories and into complex real world environments. Our software enables hand-eye coordination for robotics, allowing machines to work where they have failed in the past. Starting with strawberries, we are developing a drop-in *harvesting solution* to help growers close their labor gaps, increase their productivity, and deliver fresher, healthier food to consumers!



The Technology

Working with farmers in the fields of California and technical development at our Los Angeles headquarters, L5 Automation is proud to introduce the next evolution of robotic automation for totally unstructured agricultural environments.

Historically, agricultural harvesting has been automated using brute force mechanization like combines and shakers, but strawberries and many other specialty crops *need the gentle skillful touch of a person's hand*. More importantly berries are often hidden from view by dense foliage in peak season and *need to be located with hands and eyes*.

Many competitors have entered the space, but their technology has always fallen short due to these factors. In many cases, engineers even decided to change the farm itself to cater to the robots. At L5, we've heard it many times: *"The problem is unsolvable"*.

L5 Automation has solved the "unsolvable"



Caption: Video of L5 Automation fielding a full-foliage harvester using our patent pending two arm solution.

In the video above, you can see how we employ an intelligent sweep-to-look motion and then a position-to-grab motion using two arms. This mimics how humans actually nick berries during the most difficult part of the season when

minimize activity from berries during the most difficult part of the season when berries are ripe and foliage is thick. The entire action is done in real time using multiple camera feeds and no preprogrammed actions. The next iteration of the harvester platform will speed up and extend the movements to enable a production ready robot.

Advanced Perception and Localization

L5 is proud to announce that we received a grant from the National Science Foundation (NSF) that will go towards improving our perception and localization software that is critical to the mapping and understanding of the strawberry beds we are working on. [Read about it here](#). The grant-award from the NSF validates our approach and shows the importance of the agricultural problem we are working to solve.



Next Steps

We've built multiple prototypes, began testing on real working farms in 2021 and have even delivered our first harvested flats of strawberries.

With the help of the WeFunder community and the wider investment community, we intend to accelerate the development of our unique patent-pending solution and deploy a more robust and advanced harvester system, speed up our harvesting operations and begin expansion of our pilot programs with farmers.

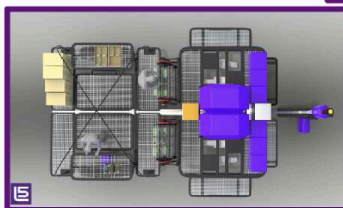
Our ultimate goal is to build a platform that can be used to automate activities where automation has struggled in the past, enabling a world in which human productivity is multiplied a thousand-fold.

Production-Ready Harvester Concept Models



**2-Row Concept
4 to 6 arms**

**Single or dual person
operators/packing
support**



**Machine designed
to be packable for
transport**

Caption: Shown are various iterations of a 2-row 5 arm concept design. All concepts are subject to change.

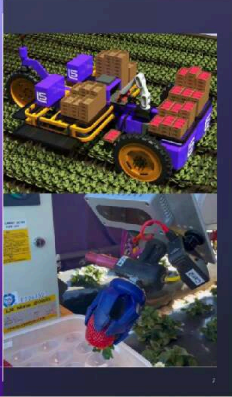
The Business of Harvesting

Harvesting as a Service

HARVESTING AS A SERVICE

We harvest when it is good for the berries,
NOT when good for humans.

Hours / Day	Up to 16	Crew	5 robots 1 human
Target Cost / Day	\$4620	Human Equivalent	10-15



L5 plans to offer harvesting as a service without requiring growers to make significant capital investments so they can scale their harvest work as needed. We expect a robot crew, made up of 5 harvesters and one human operator to harvest what would normally take 10-15 hand harvest laborers.

Also, our robot can work at night which provides farmers with an extra benefit of harvesting in cooler temperatures resulting in higher quality produce with a longer shelf life.

Farms traditionally end their harvest day after dark for many reasons ...

but with robotic harvest, farmers can continue 24/7 during peak.

Turns out this is also berry, berry beneficial for the food too!



Beyond that, our vision software can extend to multiple applications, enabling precision farming at scale. As our robots will already be imaging every square inch of a farm, it is easy to extend our business to include advanced analytics to the growers to help with pest, weed and fertilizer management.

In the future, our physical platform is also extensible. Utilizing our core vision and software technology, we can change the end effectors (i.e. robot arms and grippers) to precisely prune plants, caring for each one to maximize yield.

Why Invest in L5 Automation

COMPETITIVE ADVANTAGE OF OUR UNIQUE APPROACH

Whole Season Harvesting	Patent Pending 2-arm solution	Designed for traditional farms	True Drop-in Solution
Even under heavy foliage	Human like manipulation	No modifications to current workflow	Planned onboard inspection and clamshell packing

Platform is being designed to upscale for horizontal opportunities. Field mapping, pest management, weed management, production management, etc.



How L5 stands apart from the competition

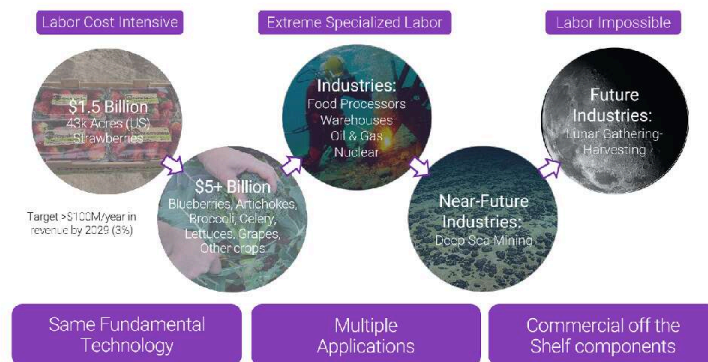
L5 is certainly not the first company to tackle automated strawberry harvesting, but we are different. To date, no competitor has fielded a system that works reliably all season long in traditional farms.

We're making sure from the outset that our system can handle peak season

foliage. Our patent-pending 2-arm approach enables human-like interaction with the environment, and this is key to allow us to operate on traditional farms (no tabletops or reconfiguration required!).

We've been working closely with GoodFarms to ensure our system fits into their existing harvest flow so we can offer a true drop-in solution – to the point we'll be integrating on-board inspection, sorting and clamshell packing.

Addressable Market and Future Opportunities



The above chart shows in our initial market of strawberries, growers spend over \$1.5B on harvesting costs of a \$3.5B market value. That means 40% of their market value is spent on direct labor costs, an untenable situation for producers.

Therefore we start with *labor-intense* applications like hand-picked produce, then move into *specialized-labor* like food processing, advanced warehouse automation.

From there we can expand into *extremely specialized* tasks like nuclear cleanup and deep-sea mining.

Finally we can utilize our core tech do work in *labor-impossible* environments, where people can't go but robots can thrive. The future applications of our core technology are practically limitless.

Revenue Discussion

We are making revenue *now*, through grants, ag-related contracting, and pilot harvest days. Currently we are on track to earn >\$400k for 2023, ~\$800k for 2024, and \$1.2-\$2M by 2025. However, where it gets really exciting is when our primary product starts reaching commercial scale, and then later when it extends to other markets.

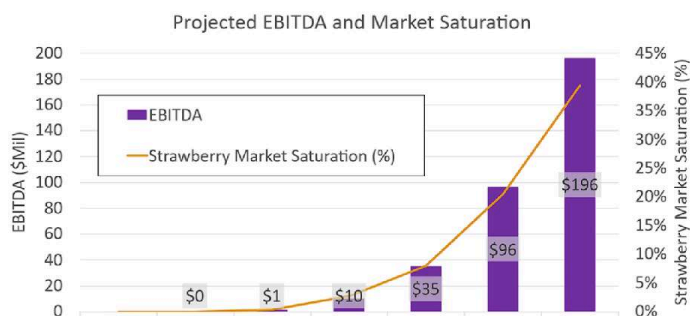
Solely focused on the target market of U.S. based strawberry Harvesting-As-A-Service and excludes additional revenue channels.

2026 Projected Strawberry Harvest Revenue

- 10 Acres under contract (<1% market saturation)
- \$3 million Gross Revenue
- \$1.2 million EBITDA

2029 Projected Strawberry Harvest Revenue

- 6000 Acres under contract (20% market saturation)
- \$141 million Gross Revenue
- \$96 million EBITDA



Caption: Please note our revenue projections only include basic classification, strawberry harvesting, on-board packaging. Not included are tack-on services which would generate additional revenue streams.

Market Saturation

After significant market research with commercial farmers and experts in Ag Tech, we feel very confident that when our service achieves parity with human labor cost per acre, we expect to be able to achieve significant market share. Also over time, human labor costs continue to increase, but our harvester will decrease in cost per acre which further supports our aggressive market capture rate.

Finally our core technology and proprietary research will be patent protected which should minimize copy cat solutions. The biggest factor that will limit our growth is our ability to build enough robots to meet demand.

A Brilliant Team

So how do you unlock billions (if not trillions) of dollars of labor value that has been difficult to mechanize and automate? First you start with an award winning team of roboticists and engineers.



L5 founder, Alex Gutierrez (*M.S. Robotics, Carnegie Mellon '05*) earned his technical chops from Carnegie Mellon's world renowned **Robotics Institute**, co-leading an award-winning **autonomous race car team** in 2003-05. (It should be mentioned that the **DARPA racing project** of the early 2000s is *directly responsible* for the current revolution in driverless technology, and several people on the same team went on to lead the efforts at companies like Google and Waymo). He then co-founded **Astrobotic Technologies** from 2008-2011, a space robotics company with \$100M+ in revenue and is scheduled to land a rover on the moon this year. Afterwards, Alex spent time at **Lockheed Martin** in the space technology area developing software for satellite systems. Eventually he was overseeing corporate wide research efforts related to robotics, augmented reality, and process automation.

Dan Schneider (*M.S. Comp Sci, Stanford '12*) and Alex Gutierrez met working on complex software solutions for satellites at Lockheed Martin. There, Dan delivered safety-critical, real-time spacecraft flight software and served as principal engineer for a crucial certified simulation suite. Later at QuakeFinder, Dan managed software development and eventually took on the directorship of R&D. This included conducting novel magnetic field research and seeing it through peer review to publication, leading a team to the invite-only phase 3 finals of the **MagQuest** challenge, and delivering a scientific time-series data analysis platform. Dan now leads the software engineering effort at L5 Automation.

Edward Terry (*M.S. Robotic Systems Development, Carnegie Mellon '18*) also hails from Carnegie Mellon and is an expert in computer vision and perception. While at **NASA JPL**, Ed was part of a the DARPA **Subterranean Challenge Team** which placed 1st in the 2020 competition. Ed worked with KEF Robotics in Pittsburgh before joining the L5 Team to lead our perception and vision efforts. Ed's work in perception was critical to securing L5 Automation's grant from the **National Science Foundation** that will ultimately lead to more robust mapping and localization of fruit found in situ during harvest.

Bernardo Rocamora Jr. is a Ph.D. candidate in Robotics at West Virginia University with a background in mechanical engineering (*M.S. Mech Eng, Universidade de Sao Paulo '19*). He's worked as Manipulation Lead, and System Integration and Autonomy co-lead for the WVU Robotics team in the **NASA Space Robotics Challenge Phase-2**. He's also recipient of the Statler PhD Fellowship.

Through our work in various leading institutions, academic backgrounds, our extended network of technical advisors, business mentors, financial advisors, and legal advisors is second to none. L5 also leans heavily into direct field operations to learn directly from farmers, producers, and laborers to really understand their needs at the deepest level. We've been in the dirt since day one and have been lucky enough to engage with some of the most forward thinking producers out there like [GoodFarms](#) and [Agrovision](#).

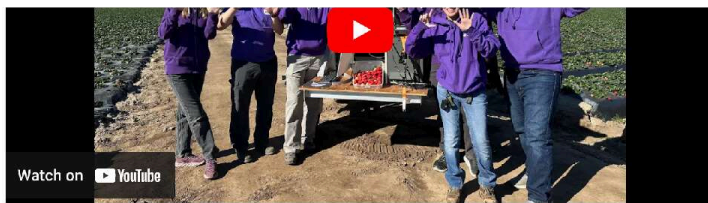
Thank you

We appreciate you reading about our company, and we invite you to join us through our WeFunder campaign. Together we can change what is possible, creating a world of plenty that all of us can enjoy together. Improving food quality for consumers by bringing fresher berries to market while reducing labor risks for farmers.



Join us on this journey





SAFE HARBOR DISCLOSURE: Forward-Looking Statements.

This information may contain “forward-looking statements” within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934. We intend all forward-looking statements to be covered by the safe harbor provisions of the Private Securities Litigation Reform Act of 1995.

Forward-looking statements generally can be identified by the fact that they do not relate strictly to historical or current facts and by the use of forward-looking words such as “expect,” “expectation,” “believe,” “anticipate,” “may,” “could,” “intend,” “belief,” “plan,” “estimate,” “target,” “predict,” “likely,” “seek,” “project,” “model,” “ongoing,” “will,” “should,” “forecast,” “outlook,” “goal” or similar terminology.

These statements are based on and reflect our current expectations, estimates, assumptions and/ or projections, our perception of historical trends and current conditions, as well as other factors that we believe are appropriate and reasonable under the circumstances.

Forward-looking statements are neither predictions nor guarantees of future events, circumstances or performance and are inherently subject to known and unknown risks, uncertainties and assumptions that could cause our actual results to differ materially from those indicated by those statements.

There can be no assurance that our expectations, estimates, assumptions and/or projections, including with respect to the future earnings and performance or capital structure of LS Automation, will prove to be correct or that any of our expectations, estimates or projections will be achieved.

All information (text, graphics, videos, etc.) related to LS Automation located herein and on WeFunder.com in general, should be considered Forward-looking statements.