

# Hessan Sedaghat

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## SUMMARY OF SKILLS

### Design & Simulation

AutoCAD, SolidWorks  
Fusion 360, KiCAD

### Programming

C++, MATLAB

### Fabrication

Electrical Prototyping Experience with  
Soldering, Arduino, Raspberry Pi,  
Sensors, Motors, CNC Mill,  
3D Printing, Laser Cutting

### Related Courses

Engineering Design I & II  
Mechatronic Systems Design  
Kinematic & Machine Design  
Entrepreneurship: CEO School

## EDUCATION

*University of Nebraska – Lincoln (UNL)* 01/2017-05/2020  
B.S. in **Mechanical Engineering with Honors** | Minors in **Robotics Engineering** and **Mathematics** CGPA 3.83/4.00  
**Honors Thesis:** “Design and Development of a Robotic System to Simulate Autonomous Management in Plant Nursery”  
**Research Interest:** New Product Development, Wearable Robotics, Biomedical Robotics, Entrepreneurship, Sustainable Design

## EXPERIENCE

*Haddington Dynamics by Ocado Group* Las Vegas, NV  
**Mechanical Engineer** 08/2022 – Present

- Work closely with software and machine learning team to develop critical hardware for robotic end-of-arm tooling (EOAT).
- Build testing fixtures to perform angular and cartesian calibration, ensuring the precision of a pick-and-place robotic arm.
- Design and prototype mechanical components using traditional and recent rapid manufacturing methods such as Vision-Controlled Jetting for large and small-scale applications.

*University of Nebraska Lincoln – Department of Biological Systems Engineering – PIE Group* Lincoln, NE  
**Systems Engineer (Part-Time)** 05/2017 – 08/2022

- Collaborated with a multidisciplinary team in all phases of new product development with an emphasis on 3D CAD design and performing failure simulation of complex assemblies.
- Implemented, programmed, and calibrated sensors, ensuring overall optimization of newly integrated autonomous systems.
- Created proposals, managed schedules, developed BOMs, wrote technical reports, and provided updates to all stakeholders.
- Developed a robotic curriculum and carried out mechatronics projects to train and educate four visiting interns from India.

*University of Nebraska Omaha – Department of Biomechanics* Omaha, NE  
**Research Engineer** 10/2020 – 07/2021

- Cooperated with vascular surgeons and biomedical engineers on research and development of non-invasive medical devices.
- Designed mechatronic systems and built a Graphical User Interface (GUI) for an autonomous catheter advancement unit for the method of Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA).
- Conducted Design of Experiments (DOE) and rapid prototyped fixtures using 3D printing methods to test and validate concepts.

*University of Nebraska Lincoln – Advanced Machinery Systems Laboratory* Lincoln, NE  
**Undergraduate Robotics Researcher (Part-Time)** 06/2018 – 06/2019

- Developed electro-mechanical systems and integrated proximity sensors for 3 autonomous mobile platforms.
- Performed kinematic analysis and programmed a 6-Degree of Freedom robotic manipulator, improving run time by 75%.
- Achieved \$8000 in funds to use in 3 separate research projects. Presented the findings at the annual American Society of Agricultural and Biological Engineers (ASABE) conference, UNL Research Symposium, and to Nebraska State Senators.

## PUBLICATION & PRESENTATIONS

### “Evaluation of Low-Cost Depth Cameras for Agricultural Research”

- *Paper:* American Society of Agricultural and Biological Engineers (Assistant to Dr. Santosh Pitla)

### “Design and Development of a Robotic System to Simulate Autonomous Management in Plant Nursery”

- *Paper:* University of Nebraska – Lincoln Undergraduate Honors Program Thesis
- *Presentation:* 2019 ASABE International Conference | Boston, MA  
2019 University of Nebraska Undergraduate Creative Activity and Research Experience (UCARE) Program  
—Spring Research Symposium | Lincoln, NE  
2019 Research Showcase for Nebraska State Senators | Lincoln, NE

### “Development and Integration of an Autonomous Robotic System for Harvesting Apples in Simulated Environments”

- *Presentation:* 2018 ASABE International Conference | Detroit, MI  
2018 University of Nebraska UCARE Program—Summer Research Symposium | Lincoln, NE

## LEADERSHIP

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UNL Robotics Club

Lincoln, NE

### President | Team Captain

08/2017 – 08/2019

- Directed overall operations including supervision of staff, delegating tasks, and managing budgets of a 25-member group.
- Generated over \$12,000 in funds enabling participation in international competitions, creation and implementation of robotics camps for youth, and facilitation of networking opportunities between students, faculty, and industry representatives.
- Represented the University of Nebraska-Lincoln at the ASABE International Robotics Design Competition and led the team to achieve 2<sup>nd</sup> place in 2017, 5<sup>th</sup> place in 2018, and 4<sup>th</sup> place in 2019.

## ACHIEVEMENTS

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**Milton E. Mohr Award (2018):** A highly competitive and prestigious award from the UNL College of Engineering, which recognizes undergraduate students based on their intellectual abilities, academic performance, and exceptional accomplishments.

### Additional Achievements:

- ASABE International Robotics Design Competition (**1<sup>st</sup> place 2022**, 4<sup>th</sup> place 2019, 5<sup>th</sup> place 2018, 2<sup>nd</sup> place 2017)
- UCARE-Undergraduate Creative Activities and Research Experience grant (2018-2019)
- Deans' List Scholar (2017-2020)
- Keith N. Newhouse Scholarship (2019)
- Iranian Scholarship Foundation Undergraduate Scholarship (2018)
- Global Laureate Scholarship (2017)
- INTIpreneur Business Plan Competition, Finalist (2016)
- University of New South Wales & Monash University Science Essay Competition Winner (2016)

## PROJECTS

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- **Moving Shade, 2022** (*Solidworks*): Designed a 3D CAD model of a semi-autonomous moving shade system to monitor the condition of pasture animals. Investigated the critical weak points using Finite Element Analysis by simulating failure scenarios and assessed the existing system for overall cost and safety.
- **ASABE International Robotic Design Competition, 2017-2022** (*SolidWorks, Arduino, 3D Printing, Laser Cutting*): Developed and programmed multiple autonomous robotic systems to execute agricultural tasks such as harvesting apples. Competed against more than 15 participants each time and obtained numerous awards globally (see achievements).
- **Poultry Robot, 2021** (*SolidWorks, Raspberry Pi, Lidar, Welding*): Designed an end effector tool on an autonomous robotic platform to herd chickens while having the ability to pick and place deceased ones in poultries.
- **Soil Sampler, 2020** (*SolidWorks, Arduino, 3D Printing, Welding*): Built an automated system to extract soil samples and monitor the dynamic forces in real time. Decreased extraction time from 30 to less than 5 minutes. The invention has helped researchers improve turf conditions in 3 golf courses across Nebraska and save thousands of dollars for the resort owners.
- **Refurbished Robotic Arm, 2019** (*OnShape, KiCAD, 3D Printing*): Modernized hardware and software components of a robotic arm controller initially built in the 1980s. Used only 30% of the sponsor's allocated budget, maintained the arm's full functionality, and reduced the controller's weight and size by more than 90%.
- **Sensi-Plate, 2019** (*AutoCAD, Raspberry Pi, 3D Printing*): Contributed to the design and testing of a smart plate capable of tracking nutritional intake in childcare settings.
- **Cloud Detection, 2019** (*MATLAB*): Developed a machine learning algorithm capable of detecting clouds in aerial images with a 92% accuracy. Proved that cloud presence affects prescription levels of fertilizers and the growth rate of corn crops over time.
- **Prosthetic Knee, 2018** (*SolidWorks, FEA, 3D Printing*): Designed, analyzed, and prototyped a cost-effective knee joint.

## COMMUNITY INVOLVEMENT

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### Inside Outside Innovation Summit Volunteer (2019)

- Ushered +150 participants, facilitated Q&A sessions and monitored presentations to fulfill technology needs during the event.

### Nowruz Celebration Volunteer (2018)

- Set up and promoted the celebration of the Persian New Year hosted by UNL Iranian Students Organization. The sold-out event gathered more than 350 participants, increased community engagement, and helped to preserve ancient cultural traditions.

### Leadership Program Participant (2017)

- Completed the Leadership course conducted by the UNL Outdoor Adventures Center. The 2-week long curriculum empowers students to collectively learn about risk management, enhance communication skills, and develop decision-making abilities.

### TEDx Talk Event Volunteer (2016)

- Facilitated TED x INTI 2016 talk, which hosted 8 international speakers with more than 100 attendees in Kuala Lumpur, MY.