# Andrew Schellenberg

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## Education

**M.S. Mechanical Engineering** – *The Ohio State University* *Expected Autumn 2023*
- GPA: 3.68/4.00. With a program focused on **perception and decision-making in autonomous systems**.
- Master's thesis: "ForgeScan: A Framework for Exploring Voxel Representations and View Selection"*, in preparation.*

**B.S. Mechanical Engineering** – *The Ohio State University* *May 2021*
- GPA: 3.61/4.00. With minors in **Robotics and Autonomous Systems** and **Computer Information Science**.
- Undergraduate thesis: "A Workflow for Training Robotic End-to-End Visuomotor Policies in Simulation".

## Work History

**Graduate Research Associate** – *AIMS Lab, The Ohio State University* *Jan 2022 – Present*
- Created a novel geometric reconstruction system **designed for flexibility, robustness, and speed**.
- Developed software in C++ and CUDA using ROS, Eigen, and Open3D with Python scripting and ParaView for vizualization.
- Advised a 4-person undergraduate capstone team on developing a vision-based robotic sorting system.
- Developed and **led multiple lab trainings** on collaborative coding practices, debugging tools, and Docker.

**Graduate Student Researcher** – *Southern Ohio Council for Higher Education* *Sept. – Dec 2021*
- Wrote **vision-based pose estimation software for inspection equipment** at the Air Force Research Labs.
- Utilized Open3D for geometric processing and OpenCV for image processing with a Microsoft Kinect V2 depth camera.

**Research Assistant** – *Design Innovation and Simulation Lab, The Ohio State University* *May 2020 – Aug. 2021*
- Trained **neural networks for end-to-end robotic control via sim-to-real behavior cloning** as an undergraduate thesis.
- Utilized TensorFlow for training recursive neural networks and CoppeliaSim for physics and robotics simulation.

**Technology Co-op** – *GE Appliances, a Haier Company* *Jun. – Aug. 2020*
- Proposed co-op training program of **16 classes** on critical technical, business management, and department-specific skills.

**Teaching Assistant** – *Department of Mechanical Engineering at The Ohio State University* *Aug. 2019 – May 2020*
- Taught **40+ students mechanics of materials** in weekly recitations with insights into challenging example problems.
- Guided students through difficult homework problems and projects during bi-weekly office hours.

**Technology Co-op** – *GE Appliances, a Haier Company* *Jan. – May 2019*
- Managed lab testing and field trials of 50+ units for a first-of-its-kind IoT smart-home water filtration unit.
- Ensured a timely product launch by **investigating and resolving hardware and software issues** with an international team.

**Research Assistant** – *Versatile Structures Lab at The Ohio State University* *May 2018 – Aug. 2019*
- Contributing author in **3 published papers on machine learning-based biomimetic design** and architected materials.
- Collected failure responses of physical samples to calibrate simulated training data.

## Project Experience

**Multi-Disciplinary Engineering Capstone** - *Technical Project, The Ohio State University* *Aug. 2020 – May 2021*
- Prototyped an autonomous, non-destructive inspection system on an industrial robot controlled by ROS and MoveIt!.
- Wrote software to **generate imaging locations for photogrammetric reconstruction** of inspection parts.
- Presented quarterly design reviews and a detailed final report to the Air Force Research Lab project sponsors.

**Translating Engineering Research to K to 8th Grade** – *Service-Learning, The Ohio State University* *Aug. – Dec. 2019*
- **Mentored a class of 20 fifth-grade students** with weekly after-school design challenges that taught STEM concepts.
- Designed an activity and lesson plan to teach students about machine learning by creating probabilistic models.

**Eagle Scout Project** – *The Ohio City Bike Co-Op, Cleveland, Ohio* *Mar. 2015*
- Organized and led **8 volunteers** to create custom, mobile bike racks from scrap material for a local cycling non-profit.

## Leadership and Additional Activities

**Texnikoi Engineering Honorary** – *President, The Ohio State University* *May 2020 – May 2021*
- Led student organization of **70+ members** and a **$21,000 budget** with monthly service and social events.
- Reworked the organization's scholarship program to increase awareness of available funds and eligibility requirements.

## Publications


[1] **A. Schellenberg**. 2023. "ForgeScan: A Framework for Exploring Voxel Representations and View Selection." Master's thesis, The Ohio State University. *In preparation*.

[2] **A. Schellenberg** and M. Groeber. 2023. "A Comparison of Voxel Representations with View Selection Efficiency." *In preparation*.

[3] **A. Schellenberg**. 2021. "A Workflow for Training Robotic End-to-End Visuomotor Policies in Simulation." Undergraduate thesis, The Ohio State University. http://hdl.handle.net/1811/92450.

[4] Y. Zhao, A. Maria Joseph, Z. Zhang, C. Ma, D. Gul, **A. Schellenberg**, and N. Hu. 2020. "Deterministic Snap-through Buckling and Energy Trapping in Axially-Loaded Notched Strips for Compliant Building Blocks." *Smart Materials and Structures* 29 (2): 02LT03. https://doi.org/10.1088/1361-665X/ab6486.

[5] C. Ma, D. Zhang, Z. Zhang, H. Zhang, **A. Schellenberg**, D. Gul, P. Feng, and N. Hu. 2019. "Exploiting Spatial Heterogeneity and Response Characterization in Non-Uniform Architected Materials Inspired by Slime Mould Growth." *Bioinspiration & Biomimetics* 14 (6): 064001. https://doi.org/10.1088/1748-3190/ab3b12.

[6] Y. Zhao, A. Maria Joseph, C. Ma, M. Skibinski, B. Gul, **A. Schellenberg**, and N. Hu. 2019. "Imperfections by Design: Interactive Buckling and Postbuckling in Architected Materials" 2019 (January): L70.248.


## Awards

**The Ohio State University**

- Honors Research Distinction — *May 2021*
- Denman Undergraduate Research Forum, Second Place — *April 2021*
- Dean's List — *Dec. 2018 – May 2021*

## Additional Technical Skills

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| SolidWorks | C/C++ | Python | ROS 1 & ROS 2 | Docker | Arduino |
| Ansys | CUDA | MATLAB | Git | Raspberry Pi | Linux |
| OpenCV | Open3D | PyTorch & LibTorch | TensorFlow | VTK & ParaView | Eigen |