Ethan Matzek

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EDUCATION

WRIGHT STATE UNIVERSITY
PhD in Computer Science
Anticipated May 2028 | Dayton, OH
MS in Computer Science
Anticipated Dec 2025 | Dayton, OH

CLARKSON UNIVERSITY
BS in Computer Science
Dec 2023 | Potsdam, NY
College of Science
With Great Distinction
Cum. GPA: 3.79 / 4.0

SKILLS

PROGRAMMING
- Python
- C++
- C#
- Java
- C
- Javascript
- MATLAB
- reStructuredText
- HTML
- LaTeX
- CSS
- Haskell
- Assembly

OTHER
- Unity
- Visual Studio
- Keras
- React
- Sphinx
- IntelliJ IDEA

LINKS

Github:// **ecmatz**
LinkedIn:// **Ethan Matzek**
Tutorials:// **VR Sensor Integration**

COURSEWORK

Deep Learning
Advanced Computer Vision
Computer Vision
Computer Graphics
Distributed Computing
Multimodal Systems
Human-Computer Interaction

VOLUNTEER

- 2024: IEEE RO-MAN

EXPERIENCE

DELSYS INC. | R&D Co-op
May 2025 – August 2025 | Natick, MA
During my time at Delsys I will contribute to the development of software and algorithm design for applications in the realm of contact and non-contact physiology, computer vision, and body movement tracking.

HILTON CENTRAL SCHOOL DISTRICT | Technology Intern
May 2023 - August 2023 | Hilton, NY
I performed technology troubleshooting, installed new hardware and software, and logged and tracked data about active technology in the district.

RESEARCH

TERASCALE ALL-SENSING RESEARCH LAB (TARS) | Researcher
May 2023 – Present | Dayton, OH & Potsdam, NY
My research uses VR as a platform to improve the well being of individuals, such as reducing hand injuries in musicians or incentivizing healthy living through exergaming.

- **Using VR to reduce repetitive strain injuries (RSIs):** I am developing learning-based algorithms and VR interfaces that provide expert and AI-guided feedback so that pianists can learn proper playing form to reduce RSIs.
  - Designed a multimodal sensing space with color and depth cameras to capture the movement of the pianist. Used Google MediaPipe to extract hand keypoints for correct and incorrect playing form for major and minor scales.
  - Developed a VR application, VRmonic [2], that allows a user to playback pieces and overlay correct playing form.
- **VR Sensor Integration:** I created an open-source tutorial and accompanying GitHub Pages website consisting of 6 modules that walks readers through the process of integrating wearable physiological sensors in VR.
  - Led a team of 7 undergraduate students to develop code and content for integrating physiological sensors, such as sEMG, heartrate, muscle oxygen, and oxygen volume, with VR using the Delsys Trigno Link.
  - Tutorials presented at the Indraprastha Institute of Information Technology, Delhi, Indian Institute of Science, Bengaluru, and City, University of London.
  - Met with collaborators at Delsys to perform testing and debugging.
- **VR Exergaming:** I am developing VR applications that incentivizes exercise through gamification by enabling character control using muscle movement and heart rate.
  - Developed an VR maze application, VitaMaze [1], that enables player control using physiological signals obtained through a heartrate and sEMG sensor.
  - Demos with Delsys at CVPR 2024, Humanoids 2024, and AIxVR 2025.

PRESENTATIONS AND DEMOS

2024 IEEE RO-MAN in Pasadena, CA: Demoed robot/sEMG integration
2024 IEEE CVPR in Seattle, WA: Demoed VR/sEMG integration
2024 IEEE AIxVR in Los Angeles, CA: Demoed VR application for reducing RSIs
2024 IEEE-RAS Humanoids in Nancy, FR: Demoed VR/sEMG integration

PUBLICATIONS

[1] E. Matzek, A. Megyeri, T. Yankee, N. Banerjee, and S. Banerjee. VitaMaze: A VR exergame driven using feedback from physiological sensors. In *IEEE International Conference on Artificial Intelligence and eXtended and Virtual Reality (AIxVR)*, 2025.
[2] E. Matzek, T. Yankee, O. Kohler, T. Lipke-Perry, N. Banerjee, and S. Banerjee. VRmonic: A vr piano playing form trainer. In *IEEE International Conference on Artificial Intelligence and eXtended and Virtual Reality (AIxVR)*, 2024.