

ERDEM MURAT

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Innovation-driven Computer Scientist with expertise in machine learning, computer vision, and virtual reality.

Education

M.S in Computer Science

January 2022 - May 2023

- Advisor: Prof. Craig (Lap-Fai) Yu.
- Member of the Design Computing and eXtended Reality (DCXR) research group.
- Leading member and Secretary of the Computer Science Graduate Students Association (CSGSA).

B.S in Computer Science

August 2018 - Decemeber 2021

Experience

Design Computing and eXtended Reality (DCXR) Lab

January 2022 – Present

Student Researcher

George Mason University

- Conducted research in computer vision, machine learning, virtual reality, game design, and systems analysis with the aim of publishing in the top academic conferences.
- Collaborated with lab members on research, and attended seminars, conferences, and related events.

Global Co Lab Network

July 2022 – Present

Virtual Reality Director

Arlington, VA

- Created virtual reality hubs for the Co Lab to host conferences and enable remote attendees to virtually view and engage with projects and fieldwork addressing social issues.
- Instructed and mentored 3 teams towards developing innovative and educational VR environments for the UN Sustainable Development Goals Metaverse Competition.
- Presented work at the United Nations Science Technology and Innovation Forum.

Publications

Predicting Users' Difficulty Perception in Virtual Reality Games

April 2023

Erdem Murat, Liuchuan Yu, Siraj Sabaj, Haikun Huang, Lap-Fai Yu

UIST 23' Under review

- Proposed a novel application of deep learning to predict users' difficulty perception in virtual reality games.
- Addressed issues in VR game design by funneling and adapting decades of existing non-VR game design research.
- Conducted 50+ user studies to collect data and train a recurrent neural network to understand recurring relationships between game parameters, user data, and gameplay data.

Understanding User Experience of Online Education in Metaverse: A Systems Perspective

November 2022

Ruizhi Cheng, Erdem Murat, Lap-Fai Yu, Songqing Chen, Bo Han

Under review

- Proposed a novel analytic method that combines qualitative and quantitative analysis with end-to-end network measurements to understand user experience in VR education and detect bottlenecks in system performance.
- Deployed a Mozilla Hubs server-client with custom JavaScript scripts to record client-side performance through an API.

Machine Learning Automation for Virtual Reality - Master's Thesis

December 2022

- Developed a system to address a limitation in VR development research and proposed a solution that uses machine learning to understand how the manipulation of game parameters affects user perception.
- Used collected data to train a machine learning algorithm of the relations between game parameters and perceived difficulty with low prediction error.

Projects

Computer Vision Based Driving Assistance for Video Game | CUDA, YOLO, Pytorch, Tensorflow

April 2023

- Designed a real-time solution that detects and does segmentation on the user's car and lanes in a video game (GTA 5) to assist in driving.
- Used YOLO and CV techniques to create a solution that is robust, fast, and efficient.

Lightweight Solution for Road Sign Detection | Pytorch, Keras, Computer Vision, Deep Learning

January 2023

- Designed a lightweight solution that detects road signs and classifies them with over 98% accuracy.

Motion Planning for A Multi-Robot System | ROS, Gazebo, Python, A.I, SLAM

November 2022

- In a team of 3, used Gazebo and ROS to create a multi-robot environment with obstacles and motion-planning using sensors and SLAM to allow for autonomous robot movement.
- Used Continuous Conflict-Base Search to build a motion planner's pipeline for multi-robot navigation without collisions.

Technical Skills

Languages: Python, C#, C++, C, Java, SQL

Developer Tools: Unity, Unreal

Softwares/Tools: Visual Studio, OpenGL, Git/GitHub, Plastic SCM, Microsoft 365, Photoshop

Other Related Experiences

Reviewer

January 2023

IEEE VR 2023

Cyber Bytes Foundation

June 2022 – July 2022

Instructor

Stafford, VA

- Developed a comprehensive, 5-day curriculum with 30 hours of educational content to teach virtual reality development concepts to 20 students.
- Harnessed knowledge based on emerging VR technology through attending lectures, conducting research, and attending seminars & conferences to construct content from the field of VR.