Niviru **Wijayaratne**

Aspiring Deep Learning and Robotics Engineer

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Education

University of Illinois at Urbana-Champaign *Champaign, IL*

Mechanical Engineering and Computer Science, GPA: 3.5 *August 2018 - May 2022*

Extra-Curriculars and Awards: President of i-MADE • Co-Founder of NeuroTech @ UIUC • 1st Place at Autodesk Design-A-Thon

Relevant Coursework: Deep Learning • CNNs for Visual Recognition • Machine Learning • Computational Photography • Robotics Autonomous Systems • Control Systems • Data Structures and Algorithms • Mechanical Design • Strength of Materials • DFM

Publications

- Yuan Shen, **Niviru Wijayaratne**, Peter Du, Shanduojiao Jiang, and Katie Driggs-Campbell. *AutoPreview*: A Framework for Autopilot Behavior Understanding. Late-Breaking Work of the ACM CHI Conference on Human Factors in Computing Systems (2021)
- Yuan Shen, **Niviru Wijayaratne**, and Katie Driggs-Campbell. Building Mental Models through Preview of Robot Behaviors. HRI Workshop on The Road to a successful HRI: AI, Trust and ethicS. (2021)

Experience

Vision Group @ UIUC *Champaign, IL*

Machine Learning Researcher *August 2020 - Present*

- Working with Professor Svetlana Lazebnik and Daniel McKee on adversarial video generation and latent space steerability and interpretability
- Ran experiments on variations of BigGAN for GAN transfer learning and trained video generation architectures on Kinetics-400
- Currently researching latent space motion editing

Human-Centered Autonomy Lab *Champaign, IL*

Machine Learning Researcher *August 2020 - Present*

- Working with Professor Katie Driggs-Campbell and Yuan Shen on explainable AI and human-robot interaction for autonomous vehicles
- Training a Soft Actor-Critic controller on the CARLA autonomous driving simulator to research effective calibration of end-user mental models for updated control policies

Carl Zeiss Meditec *Dublin, CA*

R&D Engineering Intern *June 2020 - August 2020*

- Developed a deep learning based IQA solution for quick and accurate diabetic retinopathy detection from Fundus imaging results
- Built and trained custom CNNs with VGG16, InceptionNet, ResNet, and EfficientNet backbones using TensorFlow, Keras, and OpenCV
- Conducted FEA analysis and proposed and implemented cost-efficient design changes with quick turnaround time using SolidWorks
- Wrote environmental chamber scripts for stress and thermal testing

Human Dynamics and Controls Lab *Champaign, IL*

Undergraduate Researcher *November 2019 - Present*

- Worked with Professor Elizabeth Hsiao-Wecksler and Kevin Gim on development of an arm simulator for presentation of different selectable characteristic patterns of lead-pipe rigidity and cog-wheel rigidity during flexion and extension
- Used SolidWorks to design and model electric, adjustable, and portable stand to mount robotic arm
- Built accompanying UI using Android Studio and Java, and interfaced with TI Launchpad MCU for robot control and information display

Projects

Autonomous Lane Detection

https://github.com/niviruwijayaratne/lane_detection *June 2020 - Present*

- Built lane detection pipeline for highway scenarios using OpenCV and popular computer vision and perception algorithms
- Implementing and training U-Net in PyTorch for semantic segmentation

Pose Based Pedestrian Intent Estimation

https://github.com/niviruwijayaratne/pedestrian-intent-estimation *December 2020 - Present*

- Built and trained a Pedestrian Intent Estimation module for autonomous vehicles using OpenPose and SSD in PyTorch
- Trained model on Joint Attention in Autonomous Driving (JAAD) dataset on AWS EC2

Skills

Languages and Frameworks: Python • C++ • PyTorch • TensorFlow • Keras • OpenCV • ROS • CUDA

Modeling and Analysis: SolidWorks • Creo Parametric • Gazebo • ANSYS • Moldflow

Tools and Technologies: Git • AWS • Docker • Slurm • GCP

Technical Knowledge: Deep Learning • Computer Vision • Generative Adversarial Networks • Robotics • Autonomous Systems