Kenechukwu C. Mbanisi

kene.mbanisi@gmail.com | 774-578-4063 | | linkedin.com/in/kenembanisi | github.com/kenembanisi

SUMMARY

Robotics Research & Software Engineer. Specialties in motion planning and navigation, assisted driving, shared autonomy, reinforcement learning, driver modeling, human motion modeling.

EXPERIENCE

Research Assistant, Human-Inspired Robotics (HiRO) Lab, WPI   *May 2017 - Apr 2021*
- Working on a shared autonomy framework for safe navigation of telepresence robots
- Developed an integrated human driver simulation framework for studying human-vehicle interaction in simulation
- Mentored undergraduate and masters students on research and course projects

PROJECTS

Shared Autonomy for Socially-Aware Robot Navigation | C++, ROS, Python, OpenCV
- Developing a haptic shared control framework for enabling remote teleoperation of mobile telepresence robots
- Developing dynamic collision avoidance algorithms with social navigation constraints using Velocity Obstacle-based and reinforcement learning approaches

RoboNav: Mapless Indoor Navigation using Deep Reinforcement Learning | PyTorch, ROS, Python, Gazebo
- Achieved dynamic collision avoidance for autonomous mobile robot using deep reinforcement learning
- Successfully implemented and trained models using Deep Q-Learning and DDPG algorithms

Surgical Robotics using an Industrial Manipulator Robot | ROS, Arduino, C++, Python
- Developed mechanism to enable mounting a da Vinci Research Kit insertion tool on an ABB Industrial robot
- Developed a software package consisting of kinematics, trajectory generation and teleoperation functionality

Driver Behavior Modeling via Imitation Learning | Python, MoCap, OpenSim, MATLAB
- Developed a LfD (Learning from Demonstration) approach to analyze human driver behavior and to build a motion library of driving styles
- Designed and conducted a fixed cockpit driving user study to collect vehicle maneuver motion data

Human Force Anticipation Analysis in Human Motion Control | EMG Analysis, MoCap, MATLAB
- Implemented a human motion study to gain insights into how human motor system coordinates feed-forward and feedback control strategies to achieve fast and agile motions

Personalized ADAS in CARLA | Python, CARLA
- Implemented haptic-based steering assist interface for driving assistance: Lane-assist
- Implemented torque controlled steering wheel for experimentation

EDUCATION

Doctor of Philosophy (PhD), Robotics Engineering   *Aug 2016 - Dec 2021*
Worcester Polytechnic Institute, MA, USA
Master of Science, Robotics Engineering   *Aug 2016 - May 2018*
Worcester Polytechnic Institute, MA, USA
Bachelor of Engineering, Electrical and Electronics Engineering   *Sep 2008 - Jul 2013*
Covenant University, Nigeria

SKILLS

Robotics Tools: ROS, Gazebo, RViz
Programming: C++, Python, MATLAB, LaTeX, R
Software Tools: VSCode, OpenSim, Git, PyTorch, OpenAI Gym, CARLA, Simbody, Linux
Hardware & Robots: Rethink Baxter, Universal Robot (UR5), ABB IRB 120, VEX Robot Kit, Arduino

SELECTED PUBLICATIONS

- K. C. Mbanisi, et. al, **Learning Coordinated Vehicle Maneuver Motion Primitives from Human Demonstration**, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Madrid, Italy, 2018.
- H. Kimpara, K. C. Mbanisi, et. al, **Human model-based active driving system in vehicular dynamic simulation**, IEEE Transactions on Intelligent Transportation Systems, vol. 21, no. 5, pp. 1903-1914, May 2020

ACTIVITIES

- Organizing Team Member, 2021 Pan-African Robotics Competition (PARC)
- Invited Panelist at Society, Robots and Us program by Silicon Valley Robotics
- Invited Reviewer: IEEE T-ITS (2019), IEEE IROS (2018)