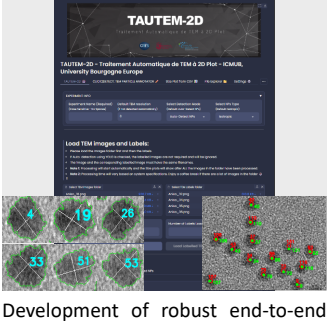
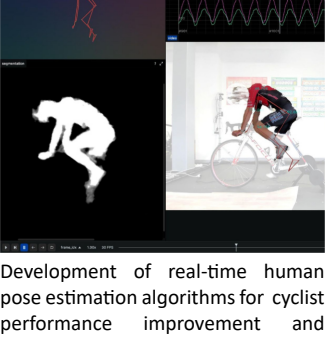
Development of a ROS-2 based holonomic autonomous mobile robot with embedded motor control (STM32, Raspberry Pi 5), LiDAR for mapping, and network-offloaded modular vision perception (YOLO and Mediapip). (2026) (In-Progress)

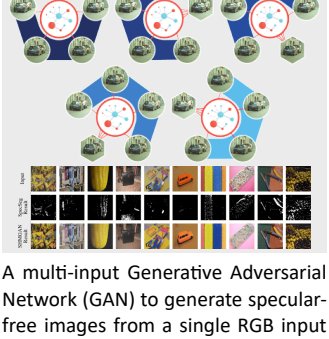
Sole developer and maintainer of FPSTACTICIAN, an interactive Strategy and planning Windows application for the Ubisoft game Rainbow Six SiegeX. Tech stack includes Electron (platform), React (frontend), Type Script and TailwindCSS with Supabase for Authentication. (2025) (FPSTactician.com)



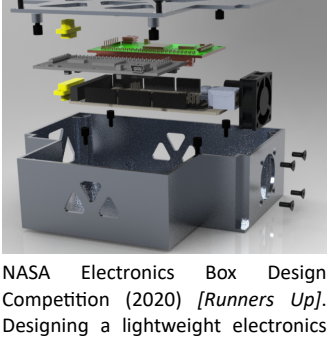
Development of robust end-to-end detection, segmentation, and analysis pipeline of Tunnelling Electron Microscopy (TEM) images of nanoparticles, using a custom-trained YOLO v8. Implemented as a interactive Gradio user interface for seamless navigation and control of the project. (2026) (ICIP-Submitted)



Development of real-time human pose estimation algorithms for cyclist performance improvement and posture correction onboard Android mobile devices, utilizing MediaPipe and transfer-learning to custom GCNs to generate accurate SMPL-X meshes. (2024)

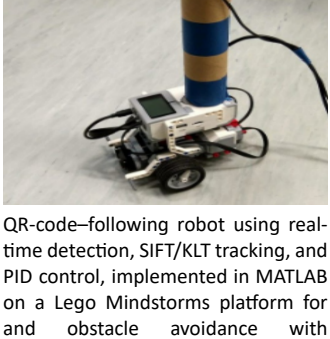


A multi-input Generative Adversarial Network (GAN) to generate specular-free images from a single RGB input image without external labels, trained using polarimetric images and showcased performance in challenging real-world scenarios (2023) [Neurocomputing] [Github]

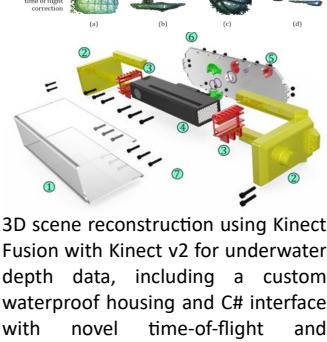


NASA Electronics Box Design Competition (2020) *[Runners Up]*. Designing a lightweight electronics box for the **NASA Astrobee Robotic Arm contest** to accommodate individual electronics boards, connectors, and a mechanical mounting bolt pattern. (2020)

Designed, prototyped and delivered a fully modular universal portable EEG headset to **Brain9D**, utilizing OpenBCI for sensing using dry electrods and a portable electronics housing for ergonomic design (2020)



QR-code–following robot using real-time detection, SIFT/KLT tracking, and PID control, implemented in MATLAB on a Lego Mindstorms platform for and obstacle avoidance with monocular vision (2017).



3D scene reconstruction using Kinect Fusion with Kinect v2 for underwater depth data, including a custom waterproof housing and C# interface with novel time-of-flight and refraction correction algorithms. (2017) [IEEE Access] [Github]