Nicolas Carpenter

ncarpenter1324@gmail.com
604-908-4369

Vancouver, BC, Canada
linkedin.com/in/nicolas-carpenter/
github.com/NicoCarpe

Education

- **University of Alberta** — Edmonton, AB
  Major in Computing Science, Minor in Mathematics — *Graduated: 2024*
  - **Course Highlights:** Clinical Neuroscience, Computer Algorithms, Computer Vision, Database Management, Linear Optimization, Linear Algebra II, Machine Learning, Ordinary Differential Equations, Reinforcement Learning, Statistics I

Work Experience

- **Fatigue Science** — Vancouver, BC
  Junior Software Engineer — *September 2021 - August 2022*
  - Specialized in back-end development of a web application for management of large workforce scheduling and metric reporting from wearable devices. Currently used by organizations such as NASA and the US Air Force.
  - Led integration of Fitbit with the web and mobile apps, expanding the user-base that could sync their data with the platform.
  - Developed and deployed APIs using Ruby and PostgreSQL connecting the front-end to the database servers.
  - Created Python scripts to automate the modification of sleep actigraphy data.
- **Blueberry** — Toronto, ON
  Junior Researcher — *July 2021 - September 2021*
  - Analyzed functional near-infrared spectroscopy (fNIRS) data retrieved from a mobile headset using Python. This involved mapping stress and exertion levels to discern fluctuations in mental states.
- **APPLab – University of Alberta** — Edmonton, AB
  Undergraduate Research Assistant — *May 2019 - September 2019*
  - Collaborated on the creation of a Python-based solution for synchronizing data from a portable Electroencephalography (EEG) system with button inputs, facilitating precise measurement of participants' reaction times to stimuli.
  - Facilitated the integration of Raspberry Pi devices for mobile EEG data collection during physical activities, such as biking. This extended the scope of the lab's cognitive studies beyond traditional laboratory settings.

Projects and Leadership Experience

- **FieldVision** — Edmonton, AB
  Computer Vision Capstone — *February 2024 - April 2024*
  - Developed a real-time tennis player tracking system using Python, integrating Meanshift for feature-based tracking and an Adaptive Kalman Filter for occlusion handling.
  - Enhanced accuracy by utilizing adaptive parameter adjustments in the Kalman Filter, based on detection confidence and occlusion conditions, to ensure consistent and reliable tracking in dynamic environments.
  - Leveraged homography transformations to map the player's positions onto a top-down representation of the field for a more strategic view of the play.
- **Automated 3D Breast Ultrasound Segmentation** — Edmonton, AB
  Research Project — *June 2023 - February 2024*
  - Leveraged the PyTorch based nnUNet framework to automate tumor segmentation in 3D breast ultrasound volumes. Optimized data preprocessing and neural network hyperparameters to improve model accuracy and efficiency.
  - Utilized bash scripting to parallelize the training and testing process on Compute Canada's high-performance computing resources, using CUDA for GPU acceleration.
- **Artificial Intelligence in Medical Systems Society** — Edmonton, AB
  Treasurer / Event Operations Manager — *December 2019 - February 2021*
  - Collaborated in the creation of the club's inaugural Artificial Intelligence in Medicine Symposium.
  - Set up info sessions and workshops with professors and local medical companies throughout the year.

Skills

Topics	Languages	Libraries & Tools
Scientific Computing	Python, Ruby, C/C++	PyTorch, OpenCV
Deep Learning	MATLAB, SQL, Bash	NumPy, Matplotlib, Linux
Back-end Development	RISC-V Assembly	Git, Docker, Jira, CI/CD