TOM CROUX

(647) 410-3655 | tcroux@torontomu.ca | LinkedIn | Toronto, ON | cerfmetal.com

EDUCATION - Toronto Metropolitan University

COMPUTER ENGINEERING UNDERGRADUATE (2021 - 2027) DEAN'S LIST
COMPUTER SCIENCE MINOR (2023 - 2027) CGPA - 3.520

PROFESSIONAL EXPERIENCE

RESEARCH ASSISTANT - Ryerson Multimedia Research Laboratory (RML) February 2024 - August 2024

- Developed an **automated system** to scan barcodes, with a resolution of 0.33mm on 2x1.5m pallets wrapped in plastic film, while moving on forklifts at 15 km/h.
- Selected and installed a high quality, fast global shutter camera, server with 10 GbE capabilities, and PoE network equipment.
- Developed a box & label & barcode detector using **Yolov8** with a custom dataset, and a Python-based enhancement algorithm using **OpenCV** and scikit-image to improve readability for accurate reading by third-party services (Dynamsoft, Scandit).

CONTROL SYSTEMS LEAD - Toronto Metropolitan Aerial Vehicles (TMAV) September 2022 - Present

- Leading and recruiting 20 members for my sub-team while helping manage the entire design team.
- Developed autonomous libraries in **ROS** for a package delivery UAV running on a Jetson Nano and a Pixhawk, with custom **Python algorithms** for surveying, path optimization, and battery management.
- Developed computer vision target tracking and plane avoidance using OAKD's and a gimbal.
- Helped develop an autonomous system coded in Python with website interface in React for a taxi UAV, running on a Jetson with Sixfab LTE modules and landing zone computer vision detection.

RESEARCH ASSISTANT - Robotics, Mechatronics, and Automation Laboratory (RMAL) October 2023 - March 2024

- Developed a custom 6D pose estimation program using **PyTorch** composed of two **CNNs**, adapted from the UNet and VGG16 architectures.
- Automated dataset generation using **Blender** and 3D models of object of interested, applying various augmentation techniques with auto annotations.

WEBSITE DEVELOPER & VIDEO PRODUCER - DMS Ameublement June 2022 - August 2022

- Collaborated with the client to assess needs, define messaging, and outline website requirements in meetings.
- Designed, developed, and hosted a fully customized website using **HTML**, **CSS**, **JavaScript, PHP**, including an admin login portal with basic encryption and content management in **SQL**.
- Filmed, edited, and produced a commercial video, integrated it into the website.
- Delivered a complete solution from concept to launch, including **SEO** and website hosting, ensuring alignment with the client's vision and business. Website link

TECHNICAL SKILLS AND AWARDS

- Programming Languages: **Python**, Java, HTML, CSS, PHP, **C**, Matlab, Assembly, JavaScript, SQL
- OS: macOS, **Linux** (Ubuntu (18, 20, 22), Debian, Raspberry Pi OS, DSM (Synology), CasaOS, **Windows**
- Server: **Docker** and Portainer, **Proxmox**, ROS, HomeAssistant, Termius, Plex, ESPHome
- Applications: Termius, Postman, KiCad, OnShape, Fusion360, Cura, QGroundControl, Betaflight, INAV
- Cloud Services: Cloudflare, RunPod.io, Planet Hoster, Zerotier, Twingate, **Google Cloud Platform**
- Manual Skills: Electronics repair (**Soldering**, microscope, DC PSU, Oscilloscope, Function Generator), Powered tools
- Hardware: Raspberry Pi (3/4, Zero W, Pico), Arduino (Uno, Leonardo), ESP32, **CPU/Memory Overclocking**
- Others: Media (Final Cut Pro, gimbals, camera), RC vehicles (custom Drones, Planes, Cars and Model Rockets)
- Awards: - **Metropolitan Engineering Competition** - Programming: 3rd, 1st, and 2nd place in 2021, 2022 and 2023 respectively
  - **Ontario Engineering Competition** - Programming: 4th place in 2022

PERSONAL PROJECTS

HomeLab:

- **Proxmox** server running HomeAssistant, Ubuntu 22.04 in an **LXC** for Web Development and Docker.
- Synology DS220+ for NAS, custom Discord bots, Docker, Portainer and Reverse Proxy.
- Mini PC running **Ubuntu 20.04** for ROS Noetic, Gaming Servers (Minecraft, Terraria, Factorio, Valheim).
- **Windows Server 2019** and OS X Mountain Lion for everyday access.
- Raspberry Pis for Octoprint and Shairport Sync.

Autonomous UAV: Assembled an RC plane with GPS, LiDAR, OAK-D camera, and a **Raspberry Pi** connected to an F4 flight controller, enabling autonomous missions and collision avoidance.

Github to website: Developed a webpage using **JavaScript**, **HTML**, and **CSS** to display public **GitHub** repository projects, using custom labels to gather and showcase live demo links, images, and project details. Github Link

Amplifier Design: Designed and simulated a single-supply, **multistage amplifier** with a +15V supply, 50 (±10%) voltage gain, and input resistance over 50 kΩ, meeting a 20 Hz to 50 kHz frequency response.

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The Six Semiconductor (TSS)
80 Tiverton Court, Suite 500
Markham, ON L3R 0G4

September 28th 2024

Dear Hiring Manager,

I am writing to express my interest in securing a co-op position at The Six Semiconductor (TSS), a rapidly growing start-up known for its high-performance mixed-signal IP solutions. As a Computer Engineering student at Toronto Metropolitan University, I have developed a strong foundation in electronics, system integration, and software development. I am eager to contribute my skills and passion for technology to TSS's team.

During my time at Toronto Metropolitan University, I have pursued coursework and hands-on projects that have equipped me with a solid understanding of circuit design, programming, and system evaluation. My academic journey has been complemented by my role as the Control Systems Lead at TMAV, where I currently manage a team of 20 to develop autonomous UAV control systems using technologies like ROS, Machine Learning, and Pixhawk flight controllers. This experience has honed my project management skills and deepened my technical expertise, aligning well with TSS's mission to offer cutting-edge solutions in the semiconductor industry.

In addition to my leadership experience, I worked independently on a project at Ryerson Multimedia Research Laboratory where I was solely responsible for the development and testing of an automated barcode scanning system. I directly contacted manufacturers to gather component information and sample data, set up high-performance servers, and integrated advanced hardware such as global shutter cameras and 10 GbE network equipment. My ability to manage all aspects of the project, from research to implementation, reflects my proactive approach to problem-solving and my passion for exploring new technologies.

I am a tech enthusiast with a deep interest in everything from server hardware and embedded systems to PCB design and electronic repairs. I enjoy working with complex systems and bringing them to optimal functionality through a combination of hardware expertise and software integration. My hands-on skills extend to building and testing RC vehicles, prototyping with 3D printers, microcontrollers, and constantly exploring new projects to keep my creativity engaged. I am driven by a passion for continuous learning and innovation, always looking for new challenges that push the boundaries of what I know.

I am excited about the opportunity to work at TSS, a company that values innovation, high performance, and technical excellence. I believe my background in control systems, circuit design, and hands-on electronics makes me a strong candidate for this role. I appreciate your consideration of my application and look forward to the possibility of discussing how I can contribute to TSS's success.

Thank you for your time, and I hope to connect with you soon.
Should you wish to contact me, please email me at tcroux@torontomu.ca or call 647-410-3655.

Sincerely,

Tom Croux