Soumil Chugh

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EDUCATION

UNIVERSITY OF TORONTO
MASc in Computer Engineering
September 2020 | Toronto, Canada

PANJAB UNIVERSITY
BE in Electronics and Communication
July 2015 | Panjab, India

LINKS

Github:// **soumilchugh**
LinkedIn:// **soumilchugh**
Twitter:// **@soumilchugh**

SKILLS

PROGRAMMING

- Python
- C++
- C

LIBRARIES

- Tensorflow
- Pytorch
- OpenCV

EXPERIENCE

HUMAN MACHINE INTERACTION LAB, HUAWEI |Research Engineer
Aug 2020 - PRESENT | Toronto

- Currently leading a team to design a Infrared based eye tracking system for in-car scenario.
- Have developed a patented algorithm that uses minimal hardware to achieve $1.5°$ accuracy.
- Used supervised and unsupervised machine learning techniques including contrastive learning for eye feature extraction.
- Lead a team to design a deep learning based RGB eye tracking system that runs on everyday devices such as laptops/smartphones.
- RGB System achieved accuracy of $5°$/30 mm under varying conditions.

GENERAL PROGNOSTICS (GPX) | Software Engineer (Consultant)
Aug 2020 - PRESENT | Toronto

- Leading the software development of a smartwatch designed for heart failure patients.
- Helped design a Computer Vision System that analyses the quality of user-generated biological sample cards.

UNIVERSITY OF TORONTO | Graduate RESEARCHER
Sep 2018 - Aug 2020 | Toronto

- Designed a binocular eye tracking system for a Virtual Reality Headset.
- Used deep learning techniques (semantic segmentation) for accurate and precise eye feature estimation.
- Wrote complete system software using three different programming languages (C++, python and C#).
- Achieved accuracy of $1°$ under device motion and changing fixation distance in 3D.

JANA CARE | Software and Hardware Engineer
Sep 2015 - Aug 2018 | Bengaluru, India

- Led the software development of a smartphone controlled robotic system that automates a complex blood test. System passed FDA approval
- Wrote and reviewed interface between a smartphone and a MSP430 for Audio Communication
- Implemented Bluetooth Low Energy Stack on Android and Cortex ARM-M4 platform.

PATENTS AND PUBLICATIONS

[1] "Eye tracking system using one corneal reflection," U.S. Patent 2022.

[2] "A method for gaze assisted mouse interaction," U.S. Patent 2022.

[3] "Gaze estimation and devices," U.S. Patent 2021.

[4] "Quality control of user generated biological sample cards," U.S. Patent 2021.

[5] "An eye tracking system for virtual reality headset," *UofT*, 2020.

[6] "Corneal reflection detection and correspondance matching using deep learning," *ICPR*, 2020.

[7] "Eye tracking system designed for a car," in progress.