

# AUSTIN MCELROY

📅 17th Jan 1981  
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## EXPERIENCE

### R&D Consultant

#### BridgeSource Medical

📅 Aug 2020 – Dec 2020 📍 Austin, Texas

- Engineered full stack application to get analog measurements from a microcontroller to a cloud database using Bluetooth Low Energy and a custom iOS / Android app. Wrote and managed the code at all stages in C, Flutter / Dart, Python, and HTML5.
- Wrote custom communication protocol for use over I2C bus and Bluetooth Low Energy, implemented in C and Dart.
- Documented all code in Doxygen and Confluence as part of tech transfer.

### Graduate Student

#### University of Texas - Austin

📅 Jan 2019 – Ongoing 📍 Austin, Texas GPA - 3.75

- Architected and wrote microcontroller code, documented code for the FDA, and designed the PCB for the **UT ABBU project**, an emergency breathing assist unit to help hospitals during COVID-19.
- Implemented semantic segmentation classification for optical coherence tomography (OCT) images using Deeplearning4Java and Tensorflow
- Writing extensible C++ backend for general purpose, multi-threaded DAQ and processing. Interfaces with a web based, HTML5 GUI front end with websockets and static webpage server.

### Research Scientist

#### University of Texas - Austin

📅 June 2012 – Jan 2019 📍 Austin, Texas

- Wrote OpenCL code to process OCT phase data to identify blood vessels, with a 600x speed up over existing code.
- Designed, fabricated, and hand soldered custom 400MHz photodetector circuits for use with high power near infrared lasers.
- Wrote extensible Labview based OCT DAQ and image processing software for use with 5 different OCT platforms.
- Wrote and managed all software for the Mechanical Engineering LAMPS 3D-Printer. This included custom FPGA and micro-controller subsystems, and multiple high speed thermal imaging cameras.

### CEO and Engineering Consultant

#### RaptorView

📅 Jan 2010 – Ongoing 📍 Austin, Texas

- Wrote software for remote IR monitoring using Rasp. Pi and FLIR Lepton.
- Wrote GUI and managed data acquisition (DAQ) for a vaginal OCT using C#.
- Wrote and released an open source package for OpenCL in Labview.
- Designed, simulated, laid out, and manufactured a high voltage flash lamp circuit for acne treatment. Applied for and managed the process to get a successful FDA 510k (K111937) for the device.

### R&D Engineer

#### Volcano Corporation

📅 June 2006 – Jan 2010 📍 Austin, Texas

- Wrote C/C++ libraries for image processing and DAQ for coronary OCT.
- Pioneered GPU computing and optimal hardware and software methods for non-linear re-sampling in real time for OCT.

## SOFTSKILLS

Learning Potential Team Work  
Organization Flexibility  
Professionalism Responsibility  
MultiTasking

## SOFTWARE SKILLS

Labview ●●●●●●●●  
Linux ●●●●●●●●  
C/C++ ●●●●●●●●  
Zephyr RTOS ●●●●●●●●  
Python ●●●●●●●●  
HTML5/Javascript/NodeJS ●●●●●●●●  
C# ●●●●●●●●  
Java ●●●●●●●●  
OpenCL ●●●●●●●●  
Dart ●●●●●●●●  
CSS ●●●●●●●●  
VHDL/Verilog ●●●●●●●●

## STRENGTHS

Doxygen Eclipse Visual Studio C++  
Visual Studio Code LaTeX RobotOS  
MongoDB Docker Zephyr RTOS  
Bluetooth 5.0 Flutter Raspberry Pi  
TensorFlow Deeplearning4Java Git  
Verilog Eagle PCB Board Design  
Soldering SPICE DAQmx  
Oscilloscopes

## PATENTS

- US Patent 8,049,900
- US Patent 9,347,765
- US Patent 10,433,861
- US Patent 10,512,482

## GRADUATE CLASSES

- EE380L - Data Mining
- EE385V - Brain Computer Interface
- EE460M - Digital Systems using HDL
- EE382V - Advanced Programming Tools

## EDUCATION

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B.Sc. in Electrical Engineering

University of Texas at Austin

📅 May 2004

M.Sc. in Electrical Engineering

University of Texas at Austin

📅 May 2021

## PUBLICATIONS

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- Katta, Nitesh, Arnold D Estrada, Austin B McElroy, Aleksandra Gruslova, Meagan Oglesby, Andrew G Cabe, Marc D Feldman, RY Declan Fleming, Andrew J Brenner, and Thomas E Milner (2019). "Laser brain cancer surgery in a xenograft model guided by optical coherence tomography". In: *Theranostics* 9.12, p. 3555.
- Gardner, Michael R, Adam Lewis, Jongwan Park, Austin B McElroy, Arnold D Estrada, Scott Fish, Joseph J Beaman, and Thomas E Milner (2018). "In situ process monitoring in selective laser sintering using optical coherence tomography". In: *Optical Engineering* 57.4, p. 041407.
- Katta, Nitesh, Austin B McElroy, Arnold D Estrada, and Thomas E Milner (2018). "Optical coherence tomography image-guided smart laser knife for surgery". In: *Lasers in surgery and medicine* 50.3, pp. 202–212.
- Lewis, Adam D, Nitesh Katta, Austin B McElroy, Thomas E Milner, Scott Fish, and Joseph J Beaman (2018). "Understanding and improving optical coherence tomography imaging depth in selective laser sintering nylon 12 parts and powder". In: *Optical Engineering* 57.4, p. 041414.
- Yang, Xiao, Massoud A Leesar, Hinan Ahmed, Vasili Lendel, Gerardo Rodriguez, Deniz Mutlu, Ian Cawich, Anand Prasad, Meagan Oglesby, Kostas Marmagkiolis, et al. (2018). "Impact of ticagrelor and aspirin versus clopidogrel and aspirin in symptomatic patients with peripheral arterial disease: Thrombus burden assessed by optical coherence tomography". In: *Cardiovascular Revascularization Medicine* 19.7, pp. 778–784.
- Baruah, Vikram, Aydin Zahedivash, Hoyt Taylor, Austin McElroy, Deborah Vela, L Maximilian Buja, Thomas Milner, and Marc Feldman (2016). "TCT-570 Histology-validated neural networks enable plaque tissue and thin-capped Fibroatheroma characterization through intravascular optical coherence tomography based virtual histology". In: *Journal of the American College of Cardiology* 68.18 Supplement, B230.
- Wroe, William Walker, Jessica Gladstone, Tim Phillips, Scott Fish, Joseph Beaman, and Austin McElroy (2016). "In-situ thermal image correlation with mechanical properties of nylon-12 in SLS". in: *Rapid Prototyping Journal* 22.5, pp. 794–800.
- Hardy, John G, Hetian Li, Jacqueline K Chow, Sydney A Geissler, Austin B McElroy, Lindsey Nguy, Derek S Hernandez, and Christine E Schmidt (2015). "Conducting polymer-based multilayer films for instructive biomaterial coatings". In: *Future science OA* 1.4.
- Wang, Tianyi, Austin McElroy, David Halaney, Deborah Vela, Edmund Fung, Shafat Hossain, Jennifer Phipps, Bingqing Wang, Biwei Yin, Marc D Feldman, et al. (2015). "Detection of plaque structure and composition using OCT combined with two-photon luminescence (TPL) imaging". In: *Lasers in surgery and medicine* 47.6, pp. 485–494.
- Yin, Biwei, Roman V Kuranov, Austin B McElroy, SM Shams Kazmi, Andrew K Dunn, Timothy Q Duong, and Thomas E Milner (2013). "Dual-wavelength photothermal optical coherence tomography for imaging microvasculature blood oxygen saturation". In: *Journal of biomedical optics* 18.5, p. 056005.
- Dwelle, Jordan, Shuang Liu, Bingqing Wang, Austin McElroy, Derek Ho, Mia K Markey, Thomas Milner, and H Grady Rylander (2012). "Thickness, phase retardation, birefringence, and reflectance of the retinal nerve fiber layer in normal and glaucomatous non-human primates". In: *Investigative ophthalmology & visual science* 53.8, pp. 4380–4395.
- Elmaanaoui, Badr, Bingqing Wang, Jordan C Dwelle, Austin B McElroy, Shuang S Liu, Henry G Rylander, and Thomas E Milner (2011). "Birefringence measurement of the retinal nerve fiber layer by swept source polarization sensitive optical coherence tomography". In: *Optics express* 19.11, pp. 10252–10268.
- Kuranov, Roman V, Shams Kazmi, Austin B McElroy, Jeffrey W Kiel, Andrew K Dunn, Thomas E Milner, and Timothy Q Duong (2011). "In vivo depth-resolved oxygen saturation by dual-wavelength photothermal (DWP) OCT". in: *Optics express* 19.24, pp. 23831–23844.
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- Kuranov, Roman V, Austin B McElroy, Nate Kemp, Stepan Baranov, Joe Taber, Marc D Feldman, and Thomas E Milner (2010). "Gas-cell referenced swept source phase sensitive optical coherence tomography". In: *IEEE Photonics Technology Letters* 22.20, pp. 1524–1526.
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