K. L. Barry Fung, PhD

Systems/Integration Engineer, Imaging and Medical Devices

barry@klfung.ca, barry.kl.fung@berkeley.edu 0000-0002-7925-8033 barryklfung

Experience, Research and Development

UNIVERSITY OF CALIFORNIA, BERKELEY | Graduate Student Researcher

Sep 2017 – Dec 2022 | Berkeley, CA, US

- Investigated superresolution and WBC tracking applications in magnetic particle imaging under Dr. Steven M. Conolly (3 papers - Nanotheranostics, Small Methods, Nano Letters)
- Integrated numerous subsystems to achieve experimental results, from in vivo work and sensor hardware to image reconstruction and analysis pipelines.
- Developed research protocols and pulse sequences investigating particle behaviour
- Designed, prototyped, and debugged investigative MPI scanners and devices
- Mentored undergraduates and jr. graduate students in research planning, data analysis, scientific communication, and technical work
- Managed discussions and logistics for medical imaging class of 40 upper-div students
- Named Outstanding GSI (top 10% of GSIs). Rated 4.8/5 (vs. dept. average of 4.1/5)

TRIPLE RING TECHNOLOGIES | Intern, Systems/In Vitro Diagnostics

Jun - Aug 2022 | Newark, CA, US

- Developed TRT's microfluidic manufacturing capabilities with CNC milling.
- Designed, machined, evaluated, and documented three major capabilities (microfluidic fitting compatibility, valving and blister pack usage) that were frequently requested by clients
- Led weekly meetings presenting device designs and test results to senior engineers.
- Created an extensive 20-page document highlighting a design and manufacturing workflow.
- Exposed to industry standards for systems engineering requirements and documentation.

XLV DIAGNOSTICS | Engineering Intern

May 2015-May 2016, Jun-Aug 2017 | Toronto, Canada

- Performed circuit design, mechanical design, optical validation for prototyping an X-ray detector using novel X-ray light valve technology from UToronto
- Coded device drivers, hardware data transfer protocols (e.g. DMA data transfer) within an RTOS on a custom Altera FPGA board
- Integrated and validated scanner readout performance with mechanical, electrical, optical, software, and semiconductor subsystems.
- Wrote and implemented engineering specs for electrical, optical, and software subsystems
- Developed a documentation, versioning, and backup system compliant with ISO 13485:2003 for planned FDA approval

Selected Publications and Presentations

KLB Fung, M Samim, A Gribble, V Barzda, and IA Vitkin

Monte Carlo simulation of polarization-sensitive second-harmonic generation and propagation in biological tissue | Journal of Biophotonics (2018) [10.1002/JBIO.201800036]

P Chandrasekharan*, KLB Fung* (co-first author), XY Zhou*, ..., SM Conolly

Non-radioactive and sensitive tracking of neutrophils towards inflammation using antibody functionalized magnetic particle imaging tracers | Nanotheranostics (2021) [10.7150/NTNO.50721]

ZW Tay, S Savliwala, DW Hensley, KLB Fung, C Colson, ..., SM Conolly

Superferromagnetic Nanoparticles Enable Order-of-Magnitude Resolution & Sensitivity Gain in Magnetic Particle Imaging | Small Methods (2021) [10.1002/SMTD.202100796]

KLB Fung, C Colson, J Bryan, C Saayujya, ... , SM Conolly

First superferromagnetic remanence characterization and scan optimization for super-resolution Magnetic Particle Imaging | Nano Letters (2023) [10.1021/ACS.NANOLETT.2C04404]

Skills

TECHNICAL

PhD:

CAD/CAM (CNC Mill, 3D Printer) • Fourier analysis • statistics • pulse programming • circuit design • electron microscopy

Other:

optical design • PCB layout • FPGA HDL • embedded systems

PROGRAMMING

Proficient:

MATLAB • Python • C/C++

Experienced:

LaTeX • Verilog HDL • Shell

Familiar:

SysML • Rust • Assembly

TOOLS/PLATFORMS

Git • Minitab • SolidWorks • VCarve • KiCad • Altium • PSPICE

Education

UC BERKELEY-UCSF GRADUATE GROUP IN BIOENGINEERING

PhD in Bioengineering

Sep 2017 - Dec 2022 | Berkeley, US

Major in Medical Imaging/Devices

Cum. GPA: 4.0/4.0

UNIVERSITY OF TORONTO

B.A.Sc. in Engineering Science with High Honors

Apr 2017 | Toronto, CA

Major in Engineering Physics

Cum. GPA: 3.89 / 4.0

Selected Honors

Siebel Scholar ('21-'22)• UC CRCC Graduate Fellow ('21-'22) • NSERC PGS-D Scholar ('20-'22)• Craven Scholar ('19)• Outstanding GSI ('19)

Coursework

Systems Engineering • Computer Hardware• Medical Imaging• Optics • Optimization Models• Laser Physics• Signal Processing