Sierra Bonilla

Computational Scientist, UCLH

sierrabonilla.com
github.com/smbonilla
linkedin.com/in/sierra-bonilla

Summary

Current computational scientist with previous experience in academic and industrial research environments at the Bioengineering Department at the University of Washington, the Medical Physics Department at University College London, the RD group at Otonexus Medical Technologies, and the Mechanical Engineering Research Group at Intellectual Ventures.

Education

Degree	Institute	Field of Study	Classification/Grade	Year
MSc	University College London	Biomedical Engineering and Medical Imaging	Distinction/A	2021-2022
BSc	University of Washington	Biomedical Engineering and Mathematics	Honors/B+	2016-2020

Experience

- **University College London Hospitals NHS Foundation Trust** *2022 - Present*
  Band 7 Clinical Scientist (Computational Scientist - Pre-Registered) London
  – Primary purpose to support clinical computer systems
  – Responsibilities include: medical device IT systems design, cybersecurity of connected medical devices, programming and computer support for clinical research, data management, and integration of AI systems in clinical settings
- **Otonexus Medical Technologies** *2020 - 2021*
  Medical Device Design Engineer/Acoustic Engineer Seattle
  – Engineer at a start-up company in the research group using MATLAB, Python, acoustic and electrical technology
  – Helped streamline transducer calibration process from 3 hours to 2 minutes per device
- **University of Washington** *2018 - 2020*
  Research Assistant & Teaching Assistant Seattle
  – Paid research assistant in the Bioengineering Department focused on image optimization, CAD, and MATLAB simulations
  – Teaching assistant for BIOEN 327 2019: Fluids & Materials Laboratory and BIOEN 420 2020: Medical Imaging
- **University of Washington Medical Center** *2019*
  Full Stack Development Consultant Seattle
  – Created a web application using Python to track and rate disease progression for Cerebral Palsy patients
- **Intellectual Ventures** *2016*
  Mechanical Engineer Intern Seattle
  – lead research on cheap alternative cold-chain vaccine transportation devices with a specific focus on CO2 technologies intended for usage in developing nations

Projects

- **Ultrasound-based Skull Registration for Transcranial Ultrasound Stimulation** *2021 - 2022*
  Master's Thesis **Github**
  – Developed algorithms to generate an ultrasound-derived point cloud of object outer surface from measured data
  – Developed acquisition scripts and gathered ultrasound measurements from skull models and subjects using a transcranial ultrasound array
  – Determined the transformation required to co-align the ultrasound-derived point cloud with a mesh-derived point cloud using tailored ICP registration techniques
- **In-vitro Bubble-Enhanced Heating for Focused Ultrasound Treatments in the Brain** *2018 - 2020*
  Bachelor's Thesis **Publication**
  – Developed and evaluated a tissue-mimicking phantom with similar acoustic properties to human tissue
  – Designed an appropriate experimental setup to perform in-vitro HIFU heating experiments

Technical Skills

- **Programming Languages**: Python, MATLAB, C/C++, HTML, CSS
- **Tools and Frameworks**: Jupyter, PyTorch, Scikit-learn, Visual Studio, Fusion 360, Adobe
- **Operating Systems**: Windows, macOS

Publications & Contributed Talks

- **Peer-reviewed Journal Article 2021**: Clark, Alicia, **Bonilla, Sierra**, Suo, Dingjie, Shapira, Yeruham, and Averkiou, Michalakis. 2021. "Microbubble-Enhanced Heating: Exploring the Effect of Microbubble Concentration and Pressure Amplitude on High-Intensity Focused Ultrasound Treatments."
  doi:10.1016/j.ultrasmedbio.2021.03.035. Ultrasound in Medicine & Biology. England: Elsevier Inc.
- **Ultrasound Symposium Contributed Talk 2020**: A. Clark, **S. Bonilla**, D. Suo, M. Averkiou (2020) Enhanced Heating with Microbubbles in High Intensity Focused Ultrasound Applications,
  The 25th European Symposium on Ultrasound Contrast Imaging, Rotterdam, The Netherlands.
- **Ultrasound Symposium Contributed Talk 2019**: D. Suo, A. Clark, **S. Bonilla**, S. Keller, M. Averkiou (2019) Controlled bubble-enhanced heating with added microbubbles,
  International Society for Therapeutic Ultrasound, Barcelona, Spain.

Positions of Responsibility

- **Lead Organizer**, AI Journal Club, University College London Hospitals *2022-Present*
- **Academic Representative**, Biomedical Engineering MSc, University College London *2021-2022*
- **Team Member**, Bioengineers Without Borders: Hydration Monitor Team, University of Washington *2019*
- **President**, Research & Innovation Club, LWIT *2015-2016*

Awards

- **Dean's List**, University of Washington *2017-2020*
- **Certificate of High Scholarship**, University of Washington *2018-2019*
- **WASLA Merit Award**, University of Washington *2018*