Sierra Bonilla

Computational Scientist, UCLH
Incoming Computer Vision PhD Candidate, UCL

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Summary

Incoming computer vision PhD candidate starting September 2023 and currently working as a computational scientist with previous experience in academic and industrial research environments at the Medical Physics Department at University College London, the R&D group at Otonexus Medical Technologies, the Bioengineering Department at the University of Washington, and the Mechanical Engineering Research Group at Intellectual Ventures.

Education

Degree	Institute	Field of Study	Classification/Grade	Year
MPhil/PhD	AI Centre at University College London	Foundational Artificial Intelligence Nueral Rendering Frameworks	N/A	2023-2027
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, SQL database 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, PowerShell, SQL, HTML & CSS
- **Tools and Frameworks**: Jupyter, PyTorch, Scikit-learn, VS Code, Microsoft SQL Server, SQLite
- **Operating Systems**: Windows, macOS, Ubuntu

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*