**Juncheng Zhang**

[andyzjc@bu.edu](mailto:andyzjc@bu.edu) | (267) 476-0705 | Boston, MA

**EDUCATION**

**Boston University College of Engineering** Expected May 2022

*Bachelor of Science In Biomedical Engineering*

* Richard D. Cohen Scholarship
* 3.68 / 4.00 GPA

**Relevant Courses:** Optical Microscopy/Spectroscopy, Biomedical Optics, Medical Imaging, Extracellular Matrix, Biomolecular Architecture, Machine Learning, Fluid mechanics, Biological Transport Phenomenon

**RESEARCH EXPERIENCE**

**BU Bio Optical & Acoustic Spectroscopy Lab** Sep 2021 - Present

* Developed a customized MATLAB GUI for establishing a robust processing workflow of multi-photon images.
* Optimized algorithms for segmentation of capillaries and targeting red blood cell stalling events.
* Validated the stalling events and conducted algorithm accuracy analysis.

**BU Growth Factor Mechanobiology Lab** Sep 2019 - Jul 2021

* Explored Raman spectroscopy for diagnosing early-stage musculoskeletal degeneration.
* Developed enzymatic, mechanical, and *in situ* models for early-stage osteoarthritis in animal species.
* Performed histological sectioning and H&E staining for cartilage specimens to cross-validate OA models with spectral data.

**Children’s Hospital of Philadelphia Research Viral Core** Jun 2019 - Sep 2019

* Experienced research in Adeno-associated virus production research and development.
* Cultured bacteria and extracted plasmid with inserted and viral genes for cell transfection.

* Performed assays for quality control and analysis, including silver stain, qPCR, and gel electrophoresis.

**SELECT PROJECTS**

**Cloud-based Framework for Organizing and Analyzing fNIRS Datasets** Jun 2021 - Present

* Designed a web-based software application for managing functional Near-Infrared Spectroscopy Datasets.
* Prototyped a Figma mockup and implemented several functionalities with the BU SAIL team.
* Scripted modules for a SNIRF API for reading, writing, and validating HDF5 data in SNIRF files.

**Raman Arthroscope**  Oct 2019 - Oct 2020

* Developed a novel Raman spectroscopic arthroscope prototype aiming for clinical experiments and testing.
* Characterized a sapphire ball lens in different mediums and conditions.
* Collaborated with orthopedic surgeons to collect spectral data on living animals at the University of Pennsylvania and presented results at the 2021 Orthopedics Research Society Conference.

**PUBLICATIONS**

| * Kimberly Kroupa\*, Man I Wu\*, **Juncheng Zhang\***,Magnus Jensen, Wei Wong, Brian D. Snyder, Mads S. Bergholt, Michael B. Albro. “Raman needle arthroscopy for in vivo molecular assessment of cartilage.” *Journal of Orthopaedic Research*. (\* indicates equal contribution) | 2021 |
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**HONORS & AWARDS**

| * 2nd Place on SB3C BS-level Student Paper Competition | 2021 |
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| * Kenneth R. Lutchen Distinguished Summer Research Fellowship | 2020 |
| * Summer Term Alumni Research Scholars Award | 2020 |
| * Undergraduate Research Opportunities Program Student Research Award | 2020 |

**SKILLS**

**Software**: MATLAB, Python, C++/C, ImageJ, Pymol, Solidworks, GitHub, Figma, Latex, Arduino

**Optics**: Raman Spectroscopy, Confocal Microscopy, Multi-photon Microscopy, Near-infrared Spectroscopy, Magnetic Resonance Imaging, Computed Tomography

**Laboratory:** Bacterial/Cell/Tissue Culture, Paraffin Sectioning, H&E Staining, ELISA, qPCR, Plasmid/DNA Extraction, Strain/Stress Analysis, Gel-electrophoresis