Crystal Abutin Mariano

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EDUCATION:

Doctor of Philosophy, Mechanical Engineering, University of California, Riverside 2020 - Present

Master of Science, Mechanical Engineering, University of California, Riverside 2020 – 2021

- Advanced Mechanical Engineering Thermodynamics, Methods of Engineering Analysis, Mechanics and Physics of Materials, Theory of Elasticity, Sustainable Product Design, Secure and Reliable Control Systems, Intro to Microelectromechanical Systems

Bachelor of Science, Bioengineering, University of California, Riverside 2015 – 2019

- Biomaterials, Dynamics of Biological Systems, Biophysics and Biothermodynamics, Medical Diagnostics, Biotechnology and Molecular Biology, Biotechnology Laboratory, Introductory Biomedical Optical Imaging, Technical Communications, Bioinstrumentation, Biosystems and Signal Analysis, Quantitative Physiology, Circulation Physiology, Biomechanics of the Human Body, Quantitative Biochemistry, Probability and Statistics of Science and Engineering, Engineering Circuit Analysis, Calculus of Several Variables

PEER REVIEWED PUBLICATIONS:

1. **Mariano CA.**, Sattari S, Anduaga, KAM, Nelson, TM, Eskandari M. Examining Lung Mechanical Strains as Influenced by Breathing Volumes and Rates Using Experimental Digital Image Correlation. *Respiratory Research* (2021, submitted)
2. Ganjeh, MM., **Mariano, CA.,** Sattari, S., Eskandari, M. Developing a Lung Model in the Age of COVID-19: A Digital Image Correlation and Inverse Finite Analysis Framework. *Frontiers Bioengineering and Biotechnology.* (2021, accepted, Special Research Topic)
3. Sattari, S.*, **Mariano, CA.*,** Kuschner, W., Taheri, H., Bates, J., Eskandari, M. Positive- and Negative-Pressure Pulmonary Ventilation Characterized by Local and Global Mechanics. *American Journal of Respiratory and Critical Care Medicine* (2021, submitted) *Equal Contributions
4. Anduaga, KAM., Nelson, TM., Sattari, S., **Mariano, CA.,** Ulu, A., Dominguez, EC., Nordgren, TM., Eskandari, M. Mouse Lung Mechanical Properties Under Varying Inflation Volumes and Cycling Frequencies. *Scientific Reports.* (2021, submitted)
5. Nelson, TM., Anduaga, KAM., **Mariano, CA.,** Sattari, S., Ulu, A., Dominguez, EC., Nordgren, T., Eskandari, M. Associating Local Strains to Global Pressure-Volume Mouse Lung Mechanics using Digital Image Correlation. *Frontiers in Physiology: Respiratory Physiology.* (2021, submitted)
6. **Mariano, CA.,** Sattari, S., Ganjeh, MM., Tartibi, M., Lo, D., Eskandari, M. Novel Mechanical Strain Characterization of Ventilated Ex Vivo Porcine and Murine Lung using Digital Image Correlation. *Frontiers in Physiology: Respiratory Physiology*. (2020) 10.3389/fphys.2020.600492.
7. Sattari, S., **Mariano, CA.,** Vittalbabu, S., Velazquez, J., Postma, J., Horst, C., Teh, E., Nordgren TM, Eskandari, M. Introducing a Custom-Designed Volume-Pressure Machine for Novel Measurements of Whole Lung Organ Viscoelasticity and Direct Comparisons between Positive- and Negative- Pressure Ventilation. *Frontiers in Biotechnology and Bioengineering: Biomechanics.* (2020) 10.3389/fbioe.2020.578762
8. Rudnicki, C., Exarhos, S., **Mariano, CA.**, Mangolini, L. Spray Pyrolysis of Yttria-Stabilized Zirconia Nanoparticles and their Densification into Bulk Transparent Windows. *Journal of Nanoparticle Research*. (2019) 22, 1-9. 10.1007/s11051-020-4766-0
9. Rutherford, D., Exarhos, S., Xu, C., Niacaris, M., **Mariano, CA.**, Dayap, B., Mangolini, L., Liu, H. Synthesis, Characterization, and Cytocompatibility of Yttria Stabilized Zirconia Nanopowders for Creating a Window to the Brain. *Journal of Biomedical Materials Research Part B: Applied Biomaterials*. (2019) 108(3), 925-938. doi.org/10.1002/jbm.b.34445

CONFERENCE PROCEEDINGS:

1. **Mariano, CA.*,** Sattari, S., Eskandari, M., (2021) Assessing the Comparative Strains Between Positive and Negative Pressure Ventilation Using Digital Image Correlation. *Summer Biomechanics, Bioengineering and Biotransport Conference (SB^{3}C),* COVID-remote. PhD Paper Competition Presentation. June 14-18, 2021.
2. Maghsoudi-Ganjeh M, **Mariano CA**, Sattari S, Eskandari M. Inverse Finite Element Modeling of the Organ-Level Breathing Lung Using Digital Image Correlation. (2021) *17th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering and the 5th Conference on Imaging and Visualization (CMBBE),* Bonn Germany, September 7-9, 2021.
3. Sattari, S., **Mariano, CA.,** Eskandari, M., (2021) Lung Mechanics of Positive- and Negative-Pressure Ventilation Under Varied Inflation Volumes. *Summer Biomechanics, Bioengineering and Biotransport Conference (SB^{3}C),* COVID-remote. PhD Paper Competition Presentation. June 14-18, 2021.
4. Maghsoudi-Ganjeh, M., **Mariano, CA.,** Sattari, S., Eskandari, M., (2021) Inverse Finite Element Modeling of Ex-Vivo Organ-Scale Porcine Lung Based on 3D Digital Image Correlation and Controlled Pressure-Volume Loading. *Summer Biomechanics, Bioengineering and Biotransport Conference (SB^{3}C),* COVID-remote. Peer-reviewed conference proceeding. June 14-18, 2021.
5. Anduaga, K., Nelson, T., Sattari, S., **Mariano, CA.,** Ulu, A., Nordgren, T., Eskandari, M., (2021) The Mechanical Similitude of Positive- Versus Negative-Pressure Ventilation in Mouse Lungs. *Summer Biomechanics, Bioengineering and Biotransport Conference (SB^{3}C),* COVID-remote. Peer-reviewed Conference Proceeding. June 14-18, 2021.
6. Nelson, T., Anduaga, K., Sattari, S., **Mariano, CA.,** Ulu, A., Nordgren, T., Eskandari, M., (2021) Investigating the Effect of Varied Breathing Rates and Volumes on the Mechanics of Murine Lungs. *Summer Biomechanics, Bioengineering and Biotransport Conference (SB^{3}C),* COVID-remote. PhD Paper Competition Presentation. June 14-18, 2021.
7. **Mariano, CA.,** Sattari, S., Maghsoudi-Ganjeh, M., Eskandari, M., (2021) The Spatial and Temporal Heterogeneity of Lung Specimens. *16th U.S. National Congress on Computational Mechanics.* Chicago, IL, (COVID-19 imposed Virtual Session), July 25-29, 2021. *Best Junior Faculty Presentation Award
8. Maghsoudi-Ganjeh M, **Mariano CA**, Sattari S, Eskandari, M. (2021) Developing Pulmonary Biomechanics Models using Digital Image Correlation: an Inverse Finite Element Analysis of Ex-Vivo Porcine Specimens. *16th U.S. National Congress on Computational Mechanics.* Chicago, IL (COVID-19 imposed Virtual Session), July 25-29, 2021. *Invited Abstract *Postdoctoral Conference Award
9. Eskandari M, Sattari S, **Mariano CA**. (2021) Investigating the Mechanics of Positive- versus Negative-Pressure Ventilation. *American Thoracic Society (ATS),* San Diego CA (COVID-19 imposed Virtual Session), May 14-19, 2021.
10. Sattari, S., **Mariano, CA,** Vittalbabu, S., Tartibi, M., Eskandari, M. (2020) Advancements in Respiratory Mechanics: Preliminary Findings from Linking Volume-Pressure Investigations to Surface Strain Mechanics in *Ex Vivo* Whole-Lung Specimens. *14th World Congress in Computational Mechanics. ECCOMAS Congress,* Paris France, COVID Delayed January 11-15, 2021. *Invited Abstract
11. Sattari, S., **Mariano, CA,** Vittalbabu, S., Velazquez, J., Postma, J., Horst, C., Teh, E., Nordgren, T., Eskandari, M. (2020) A Novel Custom-Designed Volume-Pressure Apparatus to Measure Pulmonary Mechanics. *Summer Biomechanics, Bioengineering and Biotransport Conference (SB^{3}C),* Vail CO, June 17-20, 2020. COVID-remote. Peer-reviewed Conference Proceeding.

AWARDS & HONORS:

- University of California Chancellor's Distinguished Fellowship — 2020 – 2022
- 2nd Place, Best PhD Research at ASME SB3C Conference — 2021
- Graduate Assistance in Areas of National Need Fellowship — 2020 - 2021
- University of California Chancellor's Scholarship — 2016 - 2019
- UCR Honors — 2015 - 2019