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| **Derek Nichols** | | | | | | | | |
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| dnichols32@gatech.edu  www.derek-nichols.com | | | | | | | | |
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| **EDUCATION** | | | | | | | | |
| GEORGIA INSTITUTE OF TECHNOLOGY, ATLANTA, GA  *George W. Woodruff School of Mechanical Engineering* | | | | *Expected Graduation*: April 2023 | | | | |
| * Pursuing a PhD in Mechanical Engineering * Masters earned Spring 2021 * Proposed Thesis Title: Characterization and Control of Inlet Nacelle Flow in the Presence of Crosswind and Ground Effects | | | | | | | | |
| UNIVERSITY OF PITTSBURGH, PITTSBURGH, PA  *Swanson School of Engineering* | | | | *Graduation Date*: April 30, 2017 | | | | |
| * Bachelor’s Degree in Mechanical Engineering - *Summa Cum Laude* * Minors in Bioengineering and Mathematics | | | | | | | | |
| **RESEARCH EXPERIENCE** | | | | | | | | |
| CROSSWIND NACELLE SEPARATION FUNDAMENTAL PHYSICS | | | | | | August 2017-Present | | |
| * Researching under Professor Ari Glezer * Funded by The Boeing Company * Awarded NSF GRFP fellowship to fund tuition and stipend for three years * Awarded Orville and Wilbur Wright Graduate Award by AIAA to support research * Perform experiments to better understand nacelle separation produced by crosswinds * Responsible for developing new and innovative ways to negate the effects of inlet separation  during takeoff and landing * Investigate the effect of the ground plane and the possible formation of a ground vortex | | | | | | | | |
| OSTEOCHONDRAL BIOREACTOR RESEARCH PROJECT | | | | | | December 2014-February 2018 | | |
| * Researched with university professors Dr. Paolo Zunino and Dr. Riccardo Gottardi * Awarded SSOE Summer 2016 Research Internship to conduct full time research over the summer * Developed bioreactor prototypes used to test drugs for osteoarthritis with the goal of  maximizing drug exposure using microfluidics * Created models in SolidWorks for testing in ANSYS to assess drug exposure * 3D printed models tested in a laboratory to compare theoretical and actual results | | | | | | | | |
| JOURNAL PUBLICATIONS | | | | | |  | | |
| * **D. Nichols**, I. Sondh, S. Little, P. Zunino, R. Gottardi. Design and validation of an osteochondral bioreactor for the screening of treatments for osteoarthritis. *Biomedical Microdevices.* February 14, 2018. * **D. Nichols**, I. Sondh, P. Zunino, R. Gottardi. Creating an Osteochondral Bioreactor for the Screening of Treatments for Osteoarthritis. *Ingenium 2017.* February 2017. | | | | | | | | |
| CONFERENCE PAPERS | | | | | | | | |
| * **D. Nichols**, B. Vukasinovic, A. Glezer, B. Rafferty. Formation of a Nacelle Inlet Ground Vortex in Crosswind. *AIAA SciTech 2022 Forum.* January 5, 2022. * **D. Nichols**, B. Vukasinovic, A. Glezer, M. DeFore, B. Rafferty. Steady and Unsteady Control of Nacelle Inlet Flow in Crosswind. *AIAA SciTech 2021 Forum.* January 4, 2021. * **D. Nichols**, B. Vukasinovic, A. Glezer, M. DeFore, B. Rafferty. Fluidic Control of Nacelle Inlet Flow in Crosswind. *AIAA Aviation 2020 Forum.* June 17, 2020. * **D. Nichols**, B. Vukasinovic, A. Glezer, M. DeFore, B. Rafferty, F. Palacios. Characterization and Control of a Nacelle Inlet Flow in Crosswind. *AIAA Aviation 2019 Forum.* June 21, 2019. | | | | | | | | |
| CONFERENCE PRESENTATIONS | | | | | |  | | |
| * **D. Nichols**, B. Vukasinovic, A. Glezer. Vortex Dynamics in Axisymmetric Inlet Over a Plane in a Cross Flow. *74th Annual Meeting of the APS Division of Fluid Dynamics*. November 21, 2021. * **D. Nichols**, B. Vukasinovic, A. Glezer, M. DeFore, B. Rafferty. Adaptable Fluidic Control of Round Inlet Flow in Cross Flow. *73rd Annual Meeting of the APS Division of Fluid Dynamics*. November 22, 2020. * **D. Nichols**, B. Vukasinovic, A. Glezer, M. DeFore, B. Rafferty. Fluidic Control of Round Inlet Flow in a Crosswind. *72nd Annual Meeting of the APS Division of Fluid Dynamics*. November 25, 2019. * R. Gottardi, G. Riccardis, M. Avolio, **D. Nichols**, et al. A 3D Printed Microfluidic Bioreactor to Engineer Biphasic Construct. *2018 AlChE.* November 1, 2018. * R. Gottardi, G. Riccardis, M. Avolio, **D. Nichols**, et al. A 3D Printed Microfluidic Bioreactor to Engineering Biphasic Musculoskeletal Construct. *Tissue Engineering and Regenerative Medicine International Society – World Annual Meeting.* September 6, 2018. | | | | | | | | |
| POSTERS | | | | | |  | | |
| * F. Donnaloja, G. Riccardis, **D. Nichols**, et al. Osteochondral Bioreactor for Drug Screening and Toxicity Assessments. 26th Congress of the European Society of Biomechanics. July 13, 2021. * R. Gottardi, G. Riccardis, M. Avolio, **D. Nichols**, et al. A 3D Printed Microfluidic Bioreactor to Engineering Biphasic Musculoskeletal Construct. Biomedical Engineering Society Annual Meeting, Atlanta, GA. October 18, 2018. * R. Gottardi, G. Riccardis, **D. Nichols**, et al. A 3D Printed Microfluidic Bioreactor to Engineering Biphasic Musculoskeletal Construct. Orthopedic Research Society Annual Meeting, New Orleans, LA. March 2018. * **D. Nichols**, I. Sondh, P. Zunino, R. Gottardi. Optimizing an Osteochondral Bioreactor for the Screening of Treatments for Osteoarthritis. Science 2016, Pittsburgh, PA, October 2016. * I. Sondh, **D. Nichols**, E. Bayer, R. Gottardi, S.R. Little. Development of a bioreactor aimed at designing spatial and temporal drug delivery profiles for bone regeneration protocols. Biomedical Engineering Society Annual Meeting, Minneapolis, MN, October 2016. | | | | | | | | |
| **TEACHING EXPERIENCE** | | | | | | | | |
| FLUID MECHANICS GUEST LECTURER | | | | | | Fall 2020, Fall 2021 | | |
| * Co-instructor for Ari Glezer’s Fluid Mechanics class * Taught lectures, facilitated the online chat to answer lecture questions real-time, helped to create exam questions, and made important decisions relevant to course structure * Average CIOS grade of 4.92/5 measuring overall teaching effectiveness for Fall 2020 | | | | | | | | |
| FLUID MECHANICS TEACHING ASSISTANT | | | | | | Fall 2019 | | |
| * Head TA for Ari Glezer’s Fluid Mechanics class * Average CIOS grade of 4.97/5 measuring overall teaching effectiveness * Wrote homework and exam problems and solutions, study guides, and lesson plans * Held weekly office hours and review sessions for the exams | | | | | | | | |
| TECH TO TEACHING CERTIFICATE | | | | | | | Fall 2019-Fall 2020 | |
| * To fulfill the foundations of teaching and learning, took Fundamentals in Teaching  and Learning (Fall 2019) and Course Design (Spring 2020) to give theoretical basis for teaching * Will aim to take the Teaching Capstone in Fall 2020 to assess my teaching abilities | | | | | | | | |
| CIRTL CERTIFICATE | | | | | | | Spring 2020 | |
| * Center for the Integration of Research, Teaching, and Learning (CIRTL) associate level certificate | | | | | | | | |
| MEMS SENIOR DESIGN UNDERGRADUTE TEACHING ASSISTANT | | | | | | | Spring 2017 | |
| * Asked by Dr. Schmidt to help assist senior design because of our team’s drive and work ethic * First time UTAs were ever employed for Pitt’s MEMS senior design class * Created lectures and lesson plans for both senior design and its prequel class * Ushered groups along and assessed their progress throughout the course * Acted as project sponsors for team continuing the Foldie project | | | | | | | | |
| **ACADEMIC EXPERIENCE** | | | | | | | | |
| MEMS SENIOR DESIGN: FOLDIE – THE LAUNDRY FOLDING ROBOT | | | | | | | Fall 2016 | |
| * Laundry folding robot project self-led by an interdisciplinary team of engineering students * $650 operating budget to design, prototype, build, and test the design of the system * Won best presentation, 2nd overall in electrical engineering, and 2nd overall in mechanical engineering | | | | | | | | |
| FRESHMEN ENGINEERING PROJECT | | | | | | January 2014-April 2014 | | |
| * The *da Vinci* Surgical System and Its Benefits to Radical Prostatectomies * Observed gallbladder removals with the d*a Vinci* Surgical System * Swanson School of Engineering 2014 freshmen engineering conference award winner for best poster in session | | | | | | | | |
| PITT MAKERSPACE VOLUNTEER | | | | | | April 2016-May 2017 | | |
| * Swanson School's Makerspace is a place for engineering students to create, innovate and collaborate * Volunteered three days a week overseeing and assisting in the fabrication and design of student projects | | | | | | | | |
| PI TAU SIGMA | | | | | October 2015-Present | | | |
| * National mechanical engineering honor society * Held the office of treasurer | | | | | | | | |
| COMPUTER SKILLS | | | | | |  | | |
| * Experienced with: | SolidWorks | Siemens NX | Autodesk | | MATLAB | | DaVis | Tecplot |
| * Exposure to: | EES | UNIX | C++ | | Assembly | | Python | ANSYS |
| **PROFESSIONAL EXPERIENCE** | | | | | | | | |
| SMITHMYER’S ELECTRONICS SUMMER INTERNSHIP | | | | | May 2015-August 2015 | | | |
| * Responsible for assessing building blueprints and making sure equipment is up to code * Learned how to create electrical components for needed applications * Installed wiring and devices on commercial buildings * Worked on a $50,000 project for a new AMC movie theater | | | | | | | | |
| ALLEGHENY LUTHERAN SOCIAL MINISTRIES | | | | | May 2014-August 2015 | | | |
| * Maintained the grounds and buildings and repaired broken equipment | | | | | | | | |
| PANTHER VISION | | | | | October 2014-May 2017 | | | |
| * Filmed and worked scoreboard for Pitt men’s and women’s basketball games * Worked scoreboard for Pitt baseball and softball games * Trained new members on equipment and practices | | | | | | | | |