

Derek Nichols

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EDUCATION

GEORGIA INSTITUTE OF TECHNOLOGY, ATLANTA, GA *Expected Graduation: April 2023*
George W. Woodruff School of Mechanical Engineering

- Pursuing a PhD in Mechanical Engineering

UNIVERSITY OF PITTSBURGH, PITTSBURGH, PA *Graduation Date: April 30, 2017*

Swanson School of Engineering

- 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, 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, 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 AIChE*. November 1, 2018.

POSTERS

- **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 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-Present

- 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

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