

Ethan Pickering

Personal Information

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Education

- Aug 2016 – Present **California Institute of Technology Pasadena, California**
Doctorate of Philosophy, Mechanical Engineering
- Aug 2016 – Jun 2018 **California Institute of Technology Pasadena, California**
Master of Science, Mechanical Engineering
Cumulative GPA: **3.8**
- Jan 2016 – Jul 2016 **Case Western Reserve University Cleveland, Ohio**
Master of Science, Mechanical Engineering
Thesis: EDIFES 0.4: Scalable Data Analytics for Commercial Building Virtual Energy Audits
Cumulative GPA: **4.0**
- Aug 2011 – Dec 2015 **Case Western Reserve University Cleveland, Ohio**
Bachelor of Science, Mechanical & Aerospace Engineering *summa cum laude*
Cumulative GPA: **4.0**

Research Interests

- FLUID DYNAMICS aeroacoustics, turbulence, flow mechanisms/instabilities
CONTROL reduced-order modeling, shape optimization

Academic Awards

- International Conference of Theoretical and Applied Mechanics Travel Grant, 2020+1
- **National Defense Science and Engineering Graduate Fellowship** – Award Winner, 2017
- **National Science Foundation Graduate Research Fellowship Program** – Award Winner (Declined), 2017
- **National Science Foundation Graduate Research Fellowship Program** – Honorable Mention, 2016
- Data Science Symposium Travel Award – Tohoku & Case Western Reserve University, 2016
- **Clapp Memorial Graduate Scholarship**, 2016
- SOURCE Summer Research Funding Recipient, CWRU, 2015
- Top Senior in School of Engineering, Academic Honors Assembly, 2015
- Case Alumni Association Scholarship, 2014
- Who's Who in Among Students in American Universities and Colleges Honoree, 2014
- Outstanding Under-Represented Student in School of Engineering, Office of Multicultural Affairs Unity Banquet, 2014
- Top Junior in School of Engineering, Academic Honors Assembly, 2014
- Top Sophomore in School of Engineering, Academic Honors Assembly, 2013

- **Michelson-Morley STEM Scholarship**, 2011

Academic Service & Memberships

Session Chair AIAA/CEAS Aeroacoustics Conference (Jet Noise II-III), 2019

Member American Institute of Aeronautics and Astronautics (AIAA), American Physical Society (APS), Acoustical Society of America (ASA), Tau Beta Pi

Journal Articles

1. Pickering, E., Rigas, G., Schmidt, O. T., Sipp, D., and Colonius, T., Optimal eddy viscosity for resolvent-based models of coherent structures in turbulent jets, *arXiv preprint arXiv:2005.10964*, 2020
2. Pickering, E., Rigas, G., Nogueira, P. A. S., Cavalieri, A. V. G., Schmidt, O. T., and Colonius, T., Lift-up, Kelvin–Helmholtz and Orr mechanisms in turbulent jets, *Journal of Fluid Mechanics*, Vol. 896, 2020, pp. A2
3. Pickering, E., Hossain, M. A., French, R. H., and Abramson, A. R., Building electricity consumption: Data analytics of building operations with classical time series decomposition and case based subsetting, *Energy and Buildings*, Vol. 177, 2018, pp. 184–196
4. Pickering, E., Hossain, M. A., Mousseau, J. P., Swanson, R. A., French, R. H., and Abramson, A. R., A cross-sectional study of the temporal evolution of electricity consumption of six commercial buildings, *PloS one*, Vol. 12, No. 10, 2017, pp. e0187129

Conference Papers

1. Pickering, E., Towne, A., Jordan, P., and Colonius, T., Resolvent-based jet noise models: a projection approach, *AIAA Scitech Conference and Forum*, 2020
2. Pickering, E., Rigas, G., Sipp, D., Schmidt, O. T., and Colonius, T., Eddy viscosity for resolvent-based jet noise models, *25th AIAA/CEAS Aeroacoustics Conference*, 2019, p. 2454
3. Rigas, G., Pickering, E., Schmidt, O. T., Nogueira, P. A., Cavalieri, A. V., Brès, G. A., and Colonius, T., Streaks and coherent structures in jets from round and serrated nozzles, *25th AIAA/CEAS Aeroacoustics Conference*, 2019, p. 2597
4. Nogueira, P. A., Cavalieri, A. V., Schmidt, O. T., Jordan, P., Jaunet, V., Pickering, E., Rigas, G., and Colonius, T., Resolvent-based analysis of streaks in turbulent jets, *25th AIAA/CEAS Aeroacoustics Conference*, 2019, p. 2569

Theses

Master's Thesis

Pickering, E., *EDIFES 0.4: Scalable Data Analytics for Commercial Building Virtual Energy Audits*, Master's thesis, Case Western Reserve University, 2016

Invited Talks

- Instituto Tecnológico de Aeronáutica (ITA), Brazil, Divisão de Engenharia Aeronaútica e Aeroespacial, Special Seminar, **Reduced-order modeling of turbulent jets** (2020)

Research Projects

Jun 2017 - Present

Next Generation Jet Noise Models for Complex Geometry Nozzles

Computational Flow Physics Group, California Institute of Technology, Pasadena, CA

- Produce numerous databases through Large Eddy Simulations of various geometry nozzles
- Determine stochastically forced solutions through LES databases
- Validate jet noise solutions of spatial marching technique, one-way Euler (OWE) equations
- Extend OWE method to various complex geometries for noise reduction

Aug 2015 – Aug 2016

Data Analytics for Virtual Energy Audits and Value Capture Assessments of Buildings - EDIFICES

Great Lakes Energy Institute, Case Western Reserve University, Cleveland, OH

- Formed basis for now startup company EDIFICES: <http://www.edificeanalytics.com/>
- Funded through Department of Energy ARPA-E 2015 Selection
- Project Funds Awarded: \$1,433,281
- Conducted preliminary research used in project proposal and assisted in proposal development

Aug 2014 – Aug 2016 **Data Analytics for Building Energy Efficiency**

Great Lakes Energy Institute, Case Western Reserve University, Cleveland, OH

- Funded through partnership with Cisco Systems Inc.
- Project Funds Awarded: \$400,000
- Lead energy data researcher, analyzing various building energy consumption data
- Conducted preliminary research responsible for project funding

Non-Academic Employment History

Jun 2014-Aug 2014 **NASA Glenn Research Center, Thermal Energy Branch, Mech. Eng. Test Analyst Intern** *Cleveland, OH*

- **Fission Surface Power System Project (FSP) - Power System for Extra Terrestrial Colonies**
- Supported build up and subsequent testing of the FSP Technology Demonstration Unit, TDU
- Helped develop, run, and refine a thermal and fluid dynamic system model written in MATLAB
- Developed, performed, and analyzed research on Multi-Layer Insulation for FSP implementation
- Assisted in cutting edge research of Stirling engines

Jun 2013 - Jan 2014 **Philips Healthcare, Cleveland, OH, GCX CT Engineering, Mechanical Co-Op**

- ATLAS Patient Table Project –First Multi-Modality Patient Table for CT applications
- Lead Proto Build Engineer: Led two teams from Suzhou, China to build first 8 prototypes and develop production WI
- Document redlines and issues, and led technical reviews on Atlas issues and modifications
- Design various accessories for Atlas: Infant CT Cradle—Decreases radiation exposure and dose to infants in CT scans
- Manage Atlas parts and material with strategic usage plans in conjunction with all departments at Philips, Cleveland
- Design, modify, and fabricate parts for Atlas applications using various lab equipment and material on site

Aug 2012 - Jan 2015 **Case Western Reserve University, Supplemental Instructor and Grader, Calculus I and II**

- Assisted students in learning all material presented in calculus I and II, holding 7 office hours per week
- Held 35 student recitation per week, covered material and proctored and graded tests and quizzes

Leadership Awards

- **International Balfour Award** – Most Outstanding Senior in the International Fraternity of Sigma Chi, 2016
- **\$10,000 Watson Founders/Bell Chapter Scholarship** - Top Overall Applicant, International Fraternity of Sigma Chi, 2014
- **Glenn Nichols Character of Distinction** - Exemplary Character and Dedication to challenging themselves & others, 2015
- Fraternity Chapter President of the Year - Most outstanding fraternity president, furthering chapter and the community, 2015

- Province Balfour Award - Most outstanding Sigma Chi in the Northern Ohio Province, 2016
- Chapter Balfour Award – Outstanding senior selected by CWRU Sigma Chi chapter, 2016

Leadership Affiliations

- Jun 2016 – Jun 2018 **Board of Directors, International Fraternity of Sigma Chi**
- One of 12 voting members overseeing the governance of 244 chapters of Sigma Chi in the United States and Canada
- May 2017 – Present **Mechanical Engineering Option Representative, Graduate Student Council Caltech**
- Represent mechanical engineering graduate student interests for the betterment of the campus and the graduate student experience at Caltech
- Jan 2017 – Present **Assistant Varsity Baseball Coach Caltech**
- Dec 2014 – Dec 2015 **InterFraternity Congress, President, Case Western Reserve University**
- Oversee all Fraternity operations on campus, chair all president's meetings, run the IFC executive committee, maintain communication between the fraternities, the university's Greek Life Office, and the Office of Student Affairs
- Mar 2015 – Jan 2016 **Greeks Against Sexual Assault (GASA), Co-Founder, Case Western Reserve University**
- Organization created to fight against sexual assault on college campuses, both in and out of the Greek Community. Our vision is to make campuses a safer place through policy/structural change, education, and advocacy.
- Jan 2012 – Present **Sigma Chi**
- Jan 2014 - Jan 2015 **President:** Head of all chapter operations, responsible for all chapter activities, face of the chapter to the University, the Greek Life Community, the International Fraternity and Alumni
- Aug 2011 – May 2014 **Varsity Baseball, Case Western Reserve University**
- Apr 2013 – Present **Tau Beta Pi Engineering Honor Society**
- Mar 2014 - Present **Order of Omega Greek Honor Society**