KHALED YOUNES

Department of Mechanical Engineering ◇ Stanford University
kyounes@stanford.edu

EDUCATION

Stanford University, Stanford, CA Sept. 2021 –
Ph.D. in Mechanical Engineering
Supervisor: Matthias Ihme

University of Waterloo, Waterloo, ON Sept. 2019 – July 2021
M.A Sc. in Mechanical Engineering
Thesis: Velocity scaling of high-speed turbulent boundary layer flows with wall heat transfer
Supervisor: Jean-Pierre Hickey

University of Waterloo, Waterloo, ON Sept. 2012 – Apr. 2017
B.A Sc. in Mechanical Engineering
Degree Honours: With Distinction, Dean's Honours List

PUBLICATIONS

8. G. Vignat, T. Zirwes, E. R. Toro, **K. Younes**, E. Boigné, P. Muhunthan, L. Simitz, D. Trimis, M. Ihme, "Experimental and numerical investigation of flame stabilization and pollutant formation in matrix stabilized ammonia-hydrogen combustion," *Combustion and Flame*, vol. 250, no. 112642, 2023. doi:10.1016/j.combustflame.2023.112642

7. **K. Younes** and J.-P. Hickey, "Mean velocity scaling of high-speed turbulent boundary layer flows under nonadiabatic wall conditions," *AIAA Journal*, 2022. doi:10.2514/1.J062547

6. **K. Younes**, B. Gibeau, S. Ghaemi, and J.-P. Hickey, "A Fuzzy Cluster Method for Turbulent/Non-Turbulent Interface Detection," *Experiments in Fluids*, vol. 62, no. 73, 2021. doi:10.1007/s00348-021-03169-9.

5. J.-P. Hickey, **K. Younes**, M. Yao, D. Fan, and J. Mouallem, "Targeted turbulent structure control in wall-bounded flows via localized heating," *Physics of Fluids*, vol. 32, no. 035104, 2020. doi:10.1063/1.5144387. (Featured Article; Highlighted in Scilight)

4. **K. Younes** and J.-P. Hickey, "Fluidic Thrust Shock-Vectoring Control: A Sensitivity Analysis," *AIAA Journal*, vol. 58, no. 4, 2020. doi:10.2514/1.J058922.

3. **K. Younes** and J.-P. Hickey, "Effects of shear layer growth on the indirect noise in compound nozzles," *Journal of Sound and Vibration*, vol. 468, no. 115090, 2020. doi:10.1016/j.jsv.2019.115090.

2. **K. Younes** and J.-P. Hickey, "Indirect noise prediction in compound, multi-stream nozzle flows," *Journal of Sound and Vibration*, vol. 442, pp. 609–623, 2019. doi:10.1016/j.jsv.2018.10.061.

1. J.-P. Hickey and **K. Younes**, "Path to turbulence in a transitional asymmetric planar wake," *Physics of Fluids*, vol. 31, no. 104107, 2019. doi:10.1063/1.5118891.

REFEREED CONFERENCE PROCEEDINGS

1. **K. Younes**, A. Grenke, J.-P. Hickey, M. Gagnon, and B. Elzein, "Enhanced Delayed Detached Eddy Simulations of Shock-Vector Control," *23rd AIAA International Space Planes and Hypersonic Systems and Technologies Conference*, AIAA 2020-2411. doi:10.2514/6.2020-2411.

CONFERENCE PRESENTATIONS & POSTERS

6. **K. Younes** and J.-P. Hickey, "Mean-velocity scaling of compressible turbulent boundary layer flows under non-adiabatic wall conditions," *APS Division of Fluid Dynamics Meeting Abstracts*, Nov. 2020.
5. J.-P. Hickey, H. Daryan, and **K. Younes**, "Dynamics of compound, compressible flow contractions," *APS Division of Fluid Dynamics Meeting Abstracts*, Nov. 2020.
4. M. Yao, **K. Younes**, D. Fan, J. Mouallem, and J.-P. Hickey, "Targeted modal turbulent flow control via localized heating," *APS Division of Fluid Dynamics Meeting Abstracts*, Seattle, WA, Nov. 2019.
3. **K. Younes** and J.-P. Hickey, "Effects of shear layer growth on the indirect noise in compound nozzles," *Thousand Islands Fluid Dynamics Meeting*, Gananoque, ON, Apr. 2019.
2. **K. Younes**, M. Yao, J. Wang, and J.-P. Hickey, "Towards predictive simulations for rocket propulsion," *Ontario Aerospace Council*, Toronto, ON, Mar. 2019.
1. **K. Younes** and J.-P. Hickey, "Indirect noise in compound-compressible nozzle flows," *Thousand Islands Fluid Dynamics Meeting*, Gananoque, ON, Apr. 2018.

PROFESSIONAL EXPERIENCE

Research Engineer | *Multi-Physics Interaction Laboratory* July 2017 – Aug. 2019

- Developed low-order analytical models in Python to compute the noise generated in compound nozzles and study the fluidic thrust shock-vectoring performance of rocket engines.
- Conducted global variance-based sensitivity analyses to explore the full state space, identify main flow inputs, and reveal intra-variable interactions.
- Performed multi-phase, chemically active numerical simulations in OpenFOAM, modeling the thermal decomposition of H_2O_2 for industrial NO_x emissions reduction.

TEACHING EXPERIENCE

Graduate Teaching Assistant | *Faculty of Engineering* Jan. 2020 – Aug. 2021

- Responsible for running tutorial sessions and marking exams for 85+ third-year mechanical engineering students, as part of ME 353: Heat Transfer and ME 351: Fluids Mechanics I.

In-House Residence Tutor | *Claudette Millar Hall Residence* Sept. 2017 – Apr. 2018

- Tutored 10 first-year engineering students Calculus on a weekly basis.

General Teaching Assistant | *Waterloo Engineering Endowment Foundation* Jan. 2014 – Apr. 2014

- Mentored and advised 450+ first-year students, emphasizing time management and perseverance.
- Conducted weekly and monthly help sessions in Calculus and Physics for 150 students.

AWARDS & SCHOLARSHIPS

- Postgraduate Scholarship-Doctoral (NSERC PGS D) – 63,000 CAD 2021
- Canada Graduate Scholarships-Master's Program (NSERC CGS M) – 17,500 CAD 2020
- Ontario Graduate Scholarship – 15,000 CAD (declined) 2020
- President's Graduate Scholarship – 10,000 CAD 2020
- Sandford Fleming Foundation Teaching Assistantship Excellence Award – 500 CAD 2020
- Graduate Research Studentship – 1,600 CAD 2020
- University of Waterloo Graduate Scholarship – 3,000 CAD 2020
- Engineering Excellence Master's Fellowship – 25,000 CAD 2019
- Engineering Dean's Entrance Award – 5,000 CAD 2019
- People's Choice Award – 4,500 CAD 2017
- John Deere Limited Scholarship – 2,000 CAD 2017
- First In Class Engineering Scholarship – 400 CAD 2016
- University of Waterloo President's Scholarship – 2,000 CAD 2013
- Engineering International Student Scholarship – 20,000 CAD 2013

ACADEMIC SERVICE

- Reviewer for IEEE Transactions on Aerospace & Electronic Systems
- Reviewer for Journal of Aerospace Engineering
- Reviewer for AIAA Journal

PROFESSIONAL MEMBERSHIPS

- AIAA Student Member
- APS Student Member