

Minghan Chu

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EDUCATION

- **Queen's University** Kingston, Ontario
Ph.D. in Mechanical Engineering
Quantification of Reynolds-averaged Navier-Stokes model-form Uncertainty in Transitional Boundary Layer and Airfoil Flows Sep 2018 - Jun 2022
- **University of Saskatchewan** Saskatoon, Saskatchewan
M.Sc. in Mechanical Engineering
Numerical analysis of turbulent boundary layers on rough walls using a near-wall RANS model Sep 2014 - Sep 2018
- **University of Saskatchewan** Saskatoon, Saskatchewan
B.Sc. in Mechanical Engineering Sep 2009 - Jun 2014

SKILLS SUMMARY

- **Languages:** Python and C++
- **Tools:** OpenFOAM, Matlab, ANSYS CFX, Paraview, Pointwise, Docker
- **CFD modeling methods:** Reynolds-averaged Navier-Stokes (RANS), large eddy simulation (LES)

JOURNAL PUBLICATIONS

- **1:** "Quantification of Reynolds-averaged-Navier-Stokes model form uncertainty in the transitional boundary layer and airfoil flows," *Minghan Chu, Xiaohua Wu, David E. Rival, Journal of Physics of Fluids*, 2022, vol. 34, no. 10.
- **2:** "Model form uncertainty quantification of Reynolds-averaged Navier-Stokes modeling of flows over a SD 7003 airfoil," *Minghan Chu, Xiaohua Wu, David E. Rival, Journal of Physics of Fluids*, 2022, vol. 34, no. 11.
- **3:** "Prediction of turbulent flow over a flat plate with a step change from a smooth to a rough surface using a near-wall RANS model," *Minghan Chu, D.J. Bergstrom. Journal of Fluids Engineering*, 2020, vol. 142, no. 1.
- **4:** "Uncertainty Quantification in Computational Fluid Dynamics: Physics and Machine Learning Based Approaches," *Minghan Chu arXiv*, 2023
- **5:** "Multi-fidelity Deep Learning-based methodology for epistemic uncertainty quantification of turbulence models," *Minghan Chu, Weicheng Qian arXiv*, 2023

CONFERENCE PAPERS

- **CFD Society of Canada: Minghan Chu, D.J. Bergstrom.** Prediction of turbulent flow in a rough pipe using a near-wall RANS model. *2017 CFD Society of Canada, Windsor, Ontario.*
- **Bulletin of the American Physical Society: Minghan Chu, D.J. Bergstrom.** Prediction of turbulent flow over a flat plate with a step change from a smooth to a rough surface using a near-wall RANS model. *71th American Physical Society (APS) Division of Fluid Dynamics, Denver, Colorado.*

EXPERIENCE

- **Cornell University** Ithaca, United States
Postdoctoral Associate Aug 2023 - present
 - **Inversion of real-time boundary heat fluxes:** Applying (Ensemble) Kalman filter method to the inverse heat conduction problem
 - **Inversion of heat fluxes influenced by atmospheric boundary layer:** Incorporating the Iterative Ensemble Kalman filter (IEnKF) method with RANS/LES models to address the inverse problem in the flow over urban areas
- **University of Ottawa** Ottawa, Canada
Postdoctoral Researcher Feb 2023 - Aug 2023
 - **Computational Modelling Of Tritium Transport Due To Ocular Aqueous Humor Production And Circulation:** RANS modeling of transport of tritiated water by Aqueous Humor as a transient advection-diffusion process
- **Pratt & Whitney Canada Corp.** Mississauga, Canada
Intern Sep 2019 - Dec 2019
 - **Transitional flow over a low Reynolds number airfoil:** Using OpenFoAM and ANSYS CFX for simulating transitional flows around an airfoil. With careful calibrations, the accuracy of the predicted outcomes showed a substantial improvement when compared to the existing high-fidelity data.

REFERENCES

- **Prof. Xiaohua Wu (Ph.D. supervisor), Canada Research Chair**
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- **Prof. Donald Bergstrom (M.Sc. supervisor)**
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