



Aidyn Aitzhan

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EDUCATION

PhD. Computational Modeling & Simulation

University of Pittsburgh, Pittsburgh, PA

2017 - 2021

GPA: 3.78/4.00

BS. Mechanics

Al-Farabi Kazakh National University, Almaty, Kazakhstan

2012 - 2016

GPA: 3.63/4.00

- Red Diploma (equivalent to Summa cum laude)
- Best student of the department (2015)

ACADEMIC POSITIONS

Research Assistant

University of Pittsburgh, Pittsburgh, PA

Sep 2017 - Dec 2021

Junior Research Associate

Research Institute of Mathematics and Mechanics, Almaty, Kazakhstan

Jun 2016 - Sep 2017

Undergraduate Laboratory Assistant

Research Institute of Mathematics and Mechanics, Almaty, Kazakhstan

Mar 2014 - Jun 2016

PROFESSIONAL EXPERIENCE & ACTIVITIES:

- Reviewer for *Journal of Applied Fluid Mechanics* and *Combustion Theory and Modelling*
 - Member of conferences organization:
 - *NSF Workshop on Machine Learning for Transport Phenomena, 2020* — Website Maintainer and Developer
 - *Frontiers of Thermal Fluid Science in Aerospace Engineering, 2019* — Website Maintainer and Developer
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EXPERTISE AND INTERESTS:

Research Interests:

- Scientific Programming and High Performance Computing
- Turbulence and Combustion Modeling and Simulations
- Computational Fluid Dynamics and High Order Methods
- Machine Learning and Reduced Order Modeling

Other Interests:

- Guitar
 - Photography
 - Hiking
 - Travelling
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SKILLS

Software and Development:

- Programming Languages and their Binding: C/C++, Python, Matlab, Julia, Fortran
- APIs for High Performance Computing: MPI, CUDA, OpenMP and OpenACC
- Simulation and Visualization Software: AMReX, Nektar++, OpenFOAM, Maple, Comsol Multiphysics, Paraview, VisIt
- Software Libraries: BLAS, LAPACK, Eigen, CVODE, NumPy, SciPy, yt, Scikit-Learn, TensorFlow
- Build-Automation Utilities: Make, CMake, SCons
- Other: Git, Web-Development and SQL

Languages:

- Fluent in English, Russian and Kazakh
- Competent in German

PUBLICATIONS

Refereed Journal Articles:

- [M. Inkarbekov, A. Aitzhan, A. Kaltayev and S. Sammak "A GPU-Accelerated Filtered Density Function Simulator of Turbulent Reacting Flows," International Journal of Computational Fluid Dynamics, vol. 34, no. 6, pp. 381-396 \(2020\).](#)
- [S. Sammak, A. Aitzhan, P. Givi and C.K. Madnia, "High Fidelity Spectral-FDF-LES of Turbulent Scalar Mixing," Combustion Science and Technology, vol. 192, no. 7, pp. 1219-1232 \(2020\).](#)
- A. Aitzhan, S. Sammak, P. Givi and A. G. Nouri, "PeleLM-FDF Solver for LES of Turbulent Reacting Flows," submitted to SIAM Journal on Scientific Computing.
- A. Aitzhan, A. G. Nouri, P. Givi and H. Babaei "Low Rank Time-Dependent Manifolds for Complex Chemistry Combustion," to be submitted to the Proceedings of the Combustion Institute.

Conference Proceedings:

- S. Sammak, A. Aitzhan, A.G. Nouri, and P. Givi, "A High-Order FDF Large Eddy Simulator of Complex Flows," Bulletin of the American Physical Society, vol. 64, no. 13, p. 151, 72nd Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, Seattle, WA, November 23-26, 2019.
- M. Inkarbekov, A. Aitzhan, S. Sammak, A. Kaltayev and P. Givi, "A GPU-Accelerated FDF Simulator," 17th International Conference on Numerical Combustion, Aachen, Germany, May 6-8, 2019.
- S. Sammak, A. Aitzhan, A. Nouri and P. Givi, "Spectral Element-hp and Discontinuous Galerkin Methods for LES-FDF in Complex Flows," 17th International Conference on Numerical Combustion, Aachen, Germany, May 6-8, 2019.
- M. Inkarbekov, A. Aitzhan, S. Sammak, P. Givi, and A. Kaltayev, "A GPU Accelerated DG-FDF Simulator for Large Eddy Simulation of Reacting Turbulent Flows," Bulletin of the American Physical Society, vol. 62, no. 14, p. 531, 70th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, Denver, CO, November 19–21, 2017.
- M. Inkarbekov, A. Aitzhan, A. Koldas, A. Kaltayev, and P. Givi, "A GPU Accelerated DG-FDF Simulator for Large Eddy Simulation of Reacting Turbulent Flows," Bulletin of the American Physical Society, March Meeting of the American Physical Society, New Orleans, LA, March 13, 2017.

Public Lectures:

- "PeleLM-FDF Large Eddy Simulator of Turbulent Reactive Flows" 74th Annual Meeting of the APS Division of Fluid Dynamics, Phoenix, AZ, November 22, 2021.
- "PeleLM-FDF Large Eddy Simulator of Turbulent Combustion," 12th U.S. National Combustion Meeting, College Station, TX (virtual), May 25, 2021.
- "A Hybrid Spectral-hp Element FDF Simulator, Workshop on "Modeling and Simulation of Turbulent Mixing and Reaction: For Power, Energy and Flight," Buffalo, NY, April 12, 2019.
- "Nodal DG for Hyperbolic PDEs", Department of Mechanics, Al-Farabi Kazakh National University, Almaty, Kazakhstan, May 24, 2018.