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Ali Kashefi

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Education

Apr. 2020 -	M.Sc. in Civil & Environmental Eng, **Stanford University**, GPA **4.00**
Sep. 2017 - Mar. 2020	Engineer[1] in Mechanical Eng, **Stanford University**, GPA **4.00**
Sep. 2014 - May. 2017	M.Sc. in Eng Mechanics, **Virginia Tech**, GPA **4.00**
Sep. 2008 - Sep. 2013	B.Sc. in Mechanical Eng, **Sharif University of Technology**, GPA **3.9**

Peer-Reviewed Journal Papers

- **A. Kashefi,** "A coarse grid projection method for accelerating free and forced convection heat transfer computations", **Results in Mathematics**, *Springer*, 75:33 (2020) 1-24

  https://doi.org/10.1007/s00025-020-1157-x

- **A. Kashefi** & A. Staples, "A finite-element coarse-grid projection method for incompressible flow simulations", **Advances in Computational Mathematics**, *Springer*, 44 (2018) 1063-1090

  https://doi.org/10.1007/s10444-017-9573-5

- **A. Kashefi**, M. Mahdinia, B. Firoozabadi, M. Amirkhosravi, G. Ahmadi & M.S. Saidi, "Multidimensional Modeling of the Stenosed Carotid Artery: A Novel CAD Approach Accompanied by an Extensive Lumped Model", **Acta Mechanica Sincia**, *Springer*, 30 (2014) 259-273

  https://doi.org/10.1007/s10409-014-0047-4

- **A. Kashefi**, "Coarse Grid Projection Methodology: A Partial Mesh Refinement Tool for Incompressible Flow Simulations", **Bulletin of the Iranian Mathematical Society**, *Springer*, 46 (2020) 177-181

  https://doi.org/10.1007/s41980-019-00249-9

- **A. Kashefi**, "A coarse-grid incremental pressure projection method for accelerating low Reynolds number incompressible flow simulations", **Journal of Computer Science**, *Springer*, (2019) 1-11

  https://doi.org/10.1007/s42044-019-00046-x

- **A. Kashefi**, "A coarse-grid projection method for accelerating incompressible MHD flow simulations", under review in **Engineering with Computers**, *Springer*, (2020)

  https://arxiv.org/abs/2003.00082

[1] http://gap.stanford.edu/handbooks/gap-handbook/chapter-4/subchapter-3/page-4-3-1

Conference Presentations

- **A. Kashefi** & A. Staples, "Acceleration of incremental pressure-correction incompressible flow computations using a coarse-grid projection method", *CFD: Algorithms I*, **69th American Physical Society Division of Fluid Dynamics Meeting**, Portland, 2016

http://meetings.aps.org/Meeting/DFD16/Session/L29.1

- **A. Kashefi** & A. Staples, "A coarse-grid projection acceleration method for finite-element incompressible flow computations", *CFD: Algorithms*, **68th American Physical Society Division of Fluid Dynamics Meeting**, Boston, 2015

https://meetings.aps.org/Meeting/DFD15/Session/R7.4

Instructor and Teaching Assistant Experiences

Summer 2018	Leading Trends in IT, **Stanford University**
Fall 2015	Fluid Mechanics Laboratory, Instructor, **Virginia Tech**
Fall 2015/Spring 2016	Intermediate Dynamics, Dr. S. L. Hendricks, **Virginia Tech**
Spring 2015	Statics, Dr. S. L. Hendricks, **Virginia Tech**
Spring 2015 & 2017	Hemodynamics, Dr. W. Grant, **Virginia Tech**
Fall 2014 & 2015	Introduction to Fluid Mechanics, Dr. A. Staples, **Virginia Tech**
Fall 2012	Machine Element Design, Dr. S. Behzadipour, **Sharif University**
Spring 2011 & 2012	Heat Transfer I, Dr. M. Shafii, **Sharif University**
Fall 2011 & 2012	Fluid Mechanics II, Dr. B. Firoozabadi, **Sharif University**

Professional Service

2019-present	Member, American Geophysical Union
2015-2017	Member, American Physical Society

Summer Internships

Summer 2016 & 2017	*Space@VT*, Developing a 2D compressible Euler equation solver

https://www.space.vt.edu/

Computer Skills

- **Programming languages:** C++, Python (Experience with TensorFlow, Keras, NumPy, and Matplotlib libraries), Java, MATLAB, Visual Basic, & Julia
- **Software:** Git, Bash, Qt, Corel Draw, Simulink, Mathematica, Tecplot, ICEM, & Gmsh

  - 11-year professional C++ experience and applied knowledge of Object-Oriented Programming (OOP), including inheritance, abstraction, and polymorphism.

Code Developments

- A Python deep learning code for the prediction of flow around bodies by a convolutional neural network (CNN) along with TensorFlow, Keras, NumPy, and Matplotlib libraries

- An object oriented C++ code for the simulation of the 2D incompressible Navier-Stokes equation using incremental/non-incremental pressure correction schemes with an unstructured finite-element discretization and a semi-implicit time integration method

- A set of C++ functions added to the previous module to solve the heat energy, Lorentz force and electric potential Poisson equations

- An object oriented C++ code added to the two previous modules to subjoin the coarse-grid-projection feature to solve the advection-diffusion and Poisson equations in unstructured meshes with two different grid resolutions

- An object oriented C++ code for solving the 2D compressible Euler equations in unstructured grids using a nodal discontinuous Galerkin method

- An object oriented C++ code for the simulation of the 2D compressible Euler equations using a first and second-order upwind schemes based on Roe's approximation Riemann solver and van Leer's slope limiter in Cartesian grids

- A C++ code for the simulation of the 2D unsteady incompressible Navier-Stokes equations with thermal convection (the Boussinesq approximation) using a pressure projection scheme with a finite-volume discretization method in Cartesian grids

- An object oriented C++ code for the simulation of the 2D static elasticity equations with the existence of a fault (discontinuous in the displacement fields and continuous in the traction fields) using a finite-element discretization and Lagrange multipliers in a domain with complex geometries

- A C++ code for the simulation of the rate-and-state friction law coupled with the 2D quasi-static elasticity equations using an adaptive Runge-Kutta method

- An object oriented C++ code for the simulation of the 2D transient heat conduction using finite difference grids with the forward time central space (FTCS), fractional step (FS), and alternating direction implicit (ADI) methods

- A visual basic code accompanied by a Graphic User Interface (GUI) for coupling two or more various 3D models with an extensive lumped model of the entire arterial network
- A C code for implementing stress-free outflow boundary conditions in ANSYS-Fluent
- Analysis of MEMS gyroscopes by MATLAB and Simulink Software

GRE Quantitative Reasoning: **170/**170

Graduate Courses at Stanford University GPA **4.00**

PDEs of Applied Mathematics
Numerical Linear Algebra
Finite Element Analysis
Elasticity and Inelasticity
Rivers, Streams, and Canals
Pathogens and Disinfections
Decision Analysis for Civil Engineers
Computational Methods in Fluid Mechanics
Numerical Methods for Compressible Flows
Unconventional Reservoir Geomechanics
Fluid Mechanics
Dams, Reservoirs, and their Sustainability
Introduction to Scientific Computing

Graduate Courses at Virginia Tech GPA **4.00**

Viscous Flow
Introduction to Ideal Flow
Compressible Flow I
Applied Tensor Analysis
Teaching Assistant Training Workshop
Introduction to Continuum Mechanics
Theory of Elasticity
Intermediate Dynamics
Wave Propagation in Solids
Communication in Engineering Mechanics

Undergraduate Courses (Sharif University of Technology) (grades out of 20)

- **Fluid Mechanics and Heat Transfer:**

Introduction to CFD: **20** (top grade)
Heat Transfer I: **20** (top grade)
Interfacial Fluid Mechanics: **19.5** (top 5%)
Heat Transfer II: **19** (top grade)
Thermodynamics II: **19** (top 5%)
Fluid Mechanics II: **18.5** (top 5%)

- **Computational Mathematics and Engineering:**

C++ Programming: **20** (top grade)
Fundamentals of Electrical Engineering: **20** (top grade)
Logical Design: **20** (top grade)
Numerical Computations: **19.7** (top 5%)
Discrete Structures: **19.3** (top 5%)
Engineering Mathematics: **19.1** (top 5%)
Differential Equations: **18.6** (top 5%)

- **Manufacturing and Design:**

Machine Element Design II: **18.7** (top 5%)
Vibrations: **18.5**
Material Science: **18.4**
Strength of Materials I: **18** (top 5%)
Statics: **18.3**

- **General Mechanical Engineering:**

English for Mechanical Engineers: **20** (top grade)
Physics I: **19** (top 5%)
Auto Mechanics Workshop: **18.7** (top grade)
Engineering Graphics I: **18.3** (top 5%)
Engineering Graphics II: **18** (top 5%)