

Alp Dener

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Skills

Optimization: PDE-constrained Problems, Gradient-based Algorithms, Sensitivity Analysis, MDO Architectures

Scientific Computing: High Performance Computing, Parallel Programming, Numerical Solution of PDEs

Programming Languages: Python, C/C++, Fortran, MATLAB

Software Libraries/Tools: MPI, PETSc, Boost, Matplotlib, F2Py, SWIG

Build Systems: GNU Make, CMake

Version Control: Git, Mercurial

CAD and Visualization: SolidEdge, Siemens NX, CATIA, Paraview

Workflow: GNU/Linux, Microsoft Windows, Microsoft Office, JetBrains PyCharm and CLion IDEs

Education

Rensselaer Polytechnic Institute	December 2017
Aeronautical Engineering, Ph.D.	GPA: 3.3/4.0
University of Maryland, Baltimore County	May 2012
Mechanical Engineering, B.S.	GPA: 3.3/4.0

Work Experience

Postdoctoral Appointee – Argonne National Laboratories	Jan 2018–Present
<i>Mathematics and Computer Science Division</i>	
○ Applied Mathematics Group	
○ Toolkit for Advanced Optimization (TAO) Project	
○ Supervisor – Dr. Todd S. Munson	
Graduate Research Assistant – Rensselaer Polytechnic Institute	Jan 2013–December 2017
<i>Optimal Design Lab</i>	
○ Investigate PDE-constrained multi-disciplinary design optimization problems	
○ Research gradient-based, reduced-space, matrix-free optimization algorithms	
○ Develop well-documented scientific code in parallel computing environments	
Undergraduate Research Assistant – University of Maryland, Baltimore County	Oct 2010–May 2011
<i>Joint Center for Earth Systems Technology</i>	
○ Construction of an optical aerosol measurement instrument	
○ Design and manufacture of high-precision optical component mounts	
○ Propose solutions for mounting the instrument on NASA GSFC science fleet aircraft	
Engineering Design Intern – Turkish Aerospace Industries	Jun 2009–Sep 2009
<i>T129 ATAK Helicopter Design Group</i>	
○ Geometric modeling and mesh generation on weapon systems	
○ Analysis of rotor downwash and its affect on fired ordnance	
○ Propose solutions for hardpoint design	

Teaching Experience

Design Optimization (MANE 4280/6963) Teaching Assistant	RPI, Fall 2016, Fall 2017
Strength of Materials (ENGR 2530) Teaching Assistant	RPI, Summer 2017
Aerospace Structures and Controls Laboratory (MANE 4920) Teaching Assistant	RPI, Spring 2013
Aerospace Structures and Materials (MANE 4060) Teaching Assistant, Guest Lecturer	RPI, Fall 2012
Aerodynamics I (MANE 4070) Teaching Assistant	RPI, Fall 2012

Publications

Journal Articles.....

Dener, Alp and Jason E. Hicken (2017). "Matrix-free Algorithm for the Optimization of Multidisciplinary Systems". In: *Structural and Multidisciplinary Optimization*, Springer. DOI: 10.1007/s00158-017-1734-0.

Hicken, Jason E. and Alp Dener (2015). "A Flexible Iterative Solver for Nonconvex, Equality-constrained Quadratic Subproblems". In: *Journal on Scientific Computing*, SIAM. DOI: 10.1137/140994496.

Conference Proceedings.....

Dener, Alp and Jason E. Hicken (2014). "Revisiting Individual Discipline Feasible with matrix-free Inexact-Newton-Krylov". In: *10th AIAA Multidisciplinary Design Optimization Conference*. National Harbor, MD, USA. DOI: 10.2514/6.2014-0110.

Dener, Alp, Gaetan K. Kenway, et al. (2015). "Comparison of Inexact- and Quasi-Newton Algorithms for Aerodynamic Shape Optimization". In: *53rd AIAA Aerospace Sciences Meeting*. Kissimmee, FL, USA. DOI: 10.2514/6.2015-1945.

Dener, Alp, Pengfei Meng, et al. (2016). "Kona: A Parallel Optimization Library for Engineering-Design Problems". In: *57th AIAA/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*. San Diego, CA, USA. DOI: 10.2514/6.2016-1422.

Graduate Coursework

o Parallel Programming	Spring 2016
o Numerical Solution of PDEs	Fall 2015
o Computational Linear Algebra	Fall 2014
o Advanced Aeroelasticity	Spring 2014
o Fundamentals of Finite Elements	Fall 2013
o Fluid Mechanics	Fall 2013
o Finite Elements for Fluid Dynamics	Fall 2013
o Intro. to Multidisciplinary Design Optimization	Spring 2013
o Finite Element Programming	Spring 2013
o Computational Fluid Dynamics	Spring 2013