Michael Andrew Park

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Education

- ▷ **Massachusetts Institute of Technology**, Cambridge, MA.
  Ph.D. in Computational Fluid Dynamics, Department of Aeronautics and Astronautics, GPA 4.66 of 5.00, September 2008.
- ▷ **NASA Langley / George Washington University**, Hampton, VA.
  Joint Institute for the Advancement of Flight Sciences M.S., Aeronautical Engineering, GPA 3.28 of 4.00, August 2000.
- ▷ **University of Southern California**, Los Angeles, CA.
  B.S., Aerospace Engineering, GPA 3.48 of 4.00, May 1998.

Research interests

Computational Fluid Dynamics (CFD) flow and adjoint solver development for analysis, solution adaptation, and design; anisotropic grid adaptation mechanics; parallel computing; software development processes.

Skills

C, Fortran, MATLAB, Ruby, Git, Subversion, GNU Autotools, LaTeX.

Work Experience

- ▷ **Research Scientist**, Langley Computational AeroSciences Branch; September 2000–present. Implemented a three-dimensional output (adjoint) based error estimation and adaptation scheme in FUN3D.[1] Implemented Message Passing Interface (MPI) communication in FUN3D. Developed a parallel, anisotropic grid adaptation library called from FUN3D (includes dynamic partition load balancing). The library is written in C, developed test-first, and contains a direct link to CAD geometry. Software manager for FUN3D and established the FUN3D distributed version control system with automated quarantine build and test for collaborative team software development. Supports numerous FUN3D users in government, industry, and academia with CFD consultation. Participated in the AIAA Drag Prediction, Supersonic Shock-Boundary Layer Interaction, and High Lift Prediction Workshops with output-adaptive grid methods. Applications in sonic boom prediction, engine plumes, and ground vehicles.
- ▷ **Research Assistant** Langley Multidisciplinary Optimization Branch; September 1998–August 2000. Applied the ADIFOR (Automatic Differentiation in FORTRAN) tool to CFL3D, a structured grid, Navier-Stokes CFD code for stability and control derivatives.
- ▷ **Co-op Flight Test Engineer** NASA Dryden Flight Research Center Aerodynamics, Propulsion, and Controls Branches; September 1995–August 1997. Improved air data reconstruction for F-18 HARV (High Alpha Research Vehicle). Supported the Linear Aerospike SR-71 Experiment (LASRE) with supersonic wind tunnel testing and computational flow solutions for stability and control prediction. Programmed a graphical modern control law design tool in MATLAB with application to the Hyper-X hypersonic free flyer. Explored alternative trajectories for Hyper-X booster and free flyer separation.

References, Publications

Available on request.

[1] http://fun3d.larc.nasa.gov, an unstructured CFD simulation tool with adjoint solver capable of analysis, design, and grid adaptation across all flow speed regimes