



Curriculum Vitae

Nicholas Lynn
nfl0001@uah.edu

Personal Details

Place of Birth: Michigan, USA
Nationality: United States of America

Education

Jan. 2002-Dec. 2007

Doctorate of Philosophy, Mechanical Engineering
Department of Mechanical Engineering
University of Tennessee Space Institute, Tullahoma, TN
Major Professor: Dr. John Steinhoff

Aug. 2005-Feb. 2006

Rheinisch-Westfaelische Technische Hochschule – Aachen
Institut für Luft- und Raumfahrt
Aachen, Germany

Sept. 1997-Dec. 2001

Bachelor of Science, Mechanical Engineering
Michigan State University, East Lansing, MI
Graduated: May 2001

Experience

Aug. 2012-Present

Lecturer, *University of Alabama in Huntsville*

Courses that I have taught have been at both the undergraduate and graduate levels. As course director for the numerical methods course I was responsible for the development of the curriculum and all laboratory activities. Laboratory exercises focused on implementing basic algorithms in MATLAB. I have also taught Computer Aided Engineering courses focusing on CAD, using Solid Edge, and FEA, using NASTRAN/Patran.

Fluid Mechanics, Air Breathing Propulsion, and Statics are other courses that I have taught. Other activities include being the faculty advisor for the UAH Human Exploration Rover Challenge (Moonbuggy) and the Pi Tau Sigma Mechanical Engineering International Honor Society.

April 2009-June 2012

CFD Consulting Engineer, *SimuTech Group*

As I consulting engineer I was exposed to a wide variety of engineering projects. Client projects typically involved the use of CFD or FEA model complex systems to answer questions of performance or cause of failure. Analyses were typically conducted using ANSYS, CFX, Fluent, ICEM, IcePak and/or Polyflow.

In addition I provided software training and technical support for products of the ANSYS simulation suite. Training varied from specialized one-on-one training to the training of large groups. Technical support often involved correcting models and ensuring that the computational model simulated the physical case and expanding the number of project in which I was involved.

April 2008-Mar. 2009

Post-doctoral Researcher, *Florida State University*

This work involved implemented the Vorticity Confinement method in oceanographic simulations. Work was also undertaken to describe the Vorticity Confinement method in terms of curvelets.

Jan. 2002-Dec. 2007

Research Assistant, *University of Tennessee Space Institute*
Department of Mechanical Engineering—Dr. John Steinhoff

My doctoral research focused on the development of capturing sharp interfaces and convecting these features long distances without numerical dissipation. Typical applications include the convection of vortices in CFD simulations (Vorticity Confinement) or short wave equation pulses (Wave Confinement). A theoretical framework was used to evaluated models in one and two dimensions before being applied to more general solvers.

My dissertation titled “Investigation of Vorticity Confinement as a High Reynolds Number Turbulence Model” focused on using these methods in CFD simulations as an Implicit Large Eddy Simulation (ILES) method. The method was validated from several canonical flows. The major advancement was the creation of a model for the confinement parameter, which is method implement into Star-CCM+.

May 2000-Dec. 2001

Undergraduate Researcher, *Michigan State University*
NSF Center for Multiphase Transport Phenomena
Department of Chemical Engineering—Dr. Charles Petty

I worked with the faculty in developing the curriculum of a Multiphase Transport Phenomena course intended for upper-level undergraduate and graduate students. The course utilized commercial CFD packages Fluent and CFX to solve industrial level problems. My focus was on the development of two tutorials—simulations of a bubble column and an HVAC header.

Articles & Books

J. Steinhoff, N. Lynn & L. Wang. “Numerics for LES: Vorticity Confinement”. In *Implicit Large Eddy Simulation: Computing Turbulent Fluid Dynamics*. Cambridge University Press. Ed. F. F. Grinstein, L. G. Margolin & W. J. Rider. 2007.

Presentations with Papers

J. Steinhoff & N. Lynn. "Treatment of Vortical Flow Using Vorticity Confinement". In *Frontiers of Computational Fluid Dynamics 2006*. World Scientific. Ed. D. A. Caughey & M. M. Hafez. 2005.

J. Steinhoff, N. Lynn, W. Yonghu, M. Fan, L. Wang & B. Dietz. "Studies Based on Vorticity Confinement". In *Implicit Large Eddy Simulation: Computing Turbulent Fluid Dynamics*. Cambridge University Press. Ed. F. F. Grinstein, L. G. Margolin & W. J. Rider. 2007.

18th AIAA Computational Fluid Dynamics Conference. Miami, FL: June 2007 (Presenter) N. Lynn & J. Steinhoff. "Large Reynolds Number Turbulence Modeling with Vorticity Confinement". AIAA 2007-3965.

International Conference on High Reynolds Number Vortex Interactions. Toulouse, France: August 2005 (Presenter) J. Steinhoff & N. Lynn. "Treatment of Small Vortical Scales in High Re Flows Using Vorticity Confinement".

7th International Conference on Mathematical and Numerical Aspects of Waves. Providence, RI: June 2005. J. Steinhoff, N. Lynn & L. Wang. "Long Range Numerical Propagation of Short Waves as Nonlinear Solitary Waves".

40th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit. Fort Lauderdale, FL: July 2004. M. Olles, N. Lynn & J. Majdalani. "The Isentropic Mach Number for Arbitrary Nozzle Area Ratio". AIAA 2004-3922.

41st Aerospace Sciences Meeting and Exhibit. Reno, NV: January 2003 J. Steinhoff, W. Dietz, S. Haas, M. Xiao, N. Lynn & M. Fan. "Simulating Small Scale Features in Fluid Dynamics and Aeroacoustics as Nonlinear Solitary Waves". AIAA 2003-0078.

Presentations without Papers

Invited Presentation to NASA Glenn. Cleveland, OH. February 2008. Modeling High Gradient Features Using Low Order Discretization Methods.

74th Annual Meeting of the Southeastern Section. Nashville, TN: November 2007 N. Lynn & J. Steinhoff. Application of Vorticity Confinement to Turbulence.

Professional Activities

AIAA Journal Reviewer
Member of American Institute of Aeronautics and Astronautics
(AIAA)
Member Society of Industrial and Applied Mathematics (SIAM)
Member American Physical Society (APS)
Member of Pi Tau Sigma

Personal Interests

Member of Land Trust of North Alabama
International traveling
Member of Huntsville Botanical Gardens