Ioannis Nompelis
Résumé

Personal Information

Residency:	U.S. Permanent Resident (green card)
Nationality:	Greek (Hellenic Republic, European Union)
Address:	3115, 2nd Avenue S., Minneapolis, MN 55408, USA
E-mail / Web:	`nompelis@umn.edu` `http://umn.edu/~nompelis` `@nompelis`
Telephone:	(++1) 612 424-0466

Objective

Assume a technical leadership position in a multi-disciplinary team working on technology and engineering innovation to advance the state-of-the-art beyond the existing paradigm.

Summary of Qualifications and Achievements

- Ph.D. in engineering with 18 years experience in academia, industry and government.
- Advanced level programmer with software engineering & design experience using several libraries/frameworks.
- Led the development of two industry-standard high-performance simulation codes (CFD/FEM & DSMC).
- Taught graduate and undergraduate level courses and published academic research articles.
- Consultanted for government organizations (NASA, AFRL), industry and private entities.
- Authored successful proposals (SBIR), reports and managed government-funded projects.
- Recognized for volunteering activities and contributions to drivers education.

Education

Ph.D. **Aerospace Engineering** University of Minnesota May 2004

Thesis: *Computational Study of Hypersonic Double-Cone Experiments for Code Validation*
(Adviser: Graham V. Candler)

- Authored computer code to simulate reacting flows for characterizing operation of experimental facilities.
- Published benchmark dataset of well-characterized experiments used globally for CFD code validation.

B. E. **Composite Materials Engineering** Winona State University May 1998

Emphasis: *Mechanical*

- Specialized curriculum in composite materials theory, design, manufacturing and characterization
- Organic and polymer chemistry
- Advanced characterization techniques (SEM, TGA, TMA)
- Statistical methods
- Process design, computer aided design/manufacturing

Employment History

Research scientist University of Minnesota, October 2016 - present, (6 years)
Department of Aerospace Engineering and Mechanics
Software developer and scientific computing researcher.
- Architecting & developing a high-performance software simulation framework.

Sr. Comp. Engineer Third Wave Systems, Inc., October 2015 - September 2016, (1 year)
Research and development (R & D)
Member of the research & development and product development groups.
- Developed algorithms/software for a number of projects and products.
- Authored successful proposals for government and outside entity projects.

Teaching Faculty University of Minnesota, 2011-2013, 2022 – present, (3+ years)
Department of Aerospace Engineering and Mechanics
Instructor for graduate and undergraduate-level courses.
- Structured topics comprising introductory and advanced level CFD courses.
- Lectured in uppergraduate level courses: Fluid Mechanics I,II,III, Hypersonics.

Research Associate University of Minnesota, June 2007 - September 2015, (9 years)
Department of Aerospace Engineering and Mechanics
Developed CFD/DSMC software and performed research in compressible flow.
- Re-engineered a state-of-the-art DSMC method to run efficiently on parallel computers.

Post-doct. Research Associate	University of Minnesota, Department of Aerospace Engineering and Mechanics	June 2004 - May 2007,	(3 years)
	Led a small team in algorithm development and performed simulation of compressible flows.		
	◦ Architected and authored the compressible fluid dynamics unstructured flow solver US3D.		
Research Assistant	University of Minnesota, Department of Aerospace Engineering and Mechanics	June 1999 - May 2004,	(5 years)
	Performed numerical simulation of hypersonic nonequilibrium flows for code validation		
Teaching Assistant	University of Minnesota, Department of Aerospace Engineering and Mechanics	September 1998 - May 1999,	(9 months)
	Prepared recitations, lectures and grading for sophomore-junior level courses		

Skills & Experience

Languages:	English (fluent/academic), French (working proficiency), Greek (native speaker)
Programming:	C, C++, Python, Javascript, Java, Objective C (for iOS), FORTRAN 77/90/95/2003.
Software:	Git, Redmine, JIRA, MySQL, MS VisualStudio, MS Office, OpenOffice, MatLab, Mathematica, R,
:	S-Plus, SAS-JMP, Pro/E, FreeCAD, TecPlot, ParaView, FreePCB.

- ◦ Parallel programming on distributed/shared memory systems (MPI & POSIX threads / OpenMP)
- ◦ Network applications programming (raw sockets UDP/TCP, SSL & Unix pipes)
- ◦ Interactive, high performance graphics with OpenGL / Xlib & GLX
- ◦ Non-interactive graphics and raytracing, image processing & 3D imaging.
- ◦ Web applications programming (scripted applications DHTML-JavaScript / PHP-MySQL)
- ◦ Microcontroller and TTL-hardware programming (Parallax Propeller, Raspberry Pi Arduino, and variants)
- ◦ Digital signal processing / Audio programming (ALSA/OSS, MIDI, etc)
- ◦ Admin-level user of the Unix system and clones with preference on the Linux kernel and GNU
- ◦ Administration of computer cluster for distributed scientific computation.
- ◦ Experience with MS Windows and MacOSX/iOS & Xcode programming.

Research Interests

- ◦ Numerical analysis of differential equations and numerical methods.
- ◦ Computational physics. Computational fluid dynamics. Computational mechanics.
- ◦ Reacting and nonequilibrium flows, plasma chemistry, radiation. Rarefied gas flows.
- ◦ Monte-Carlo and stochastic methods for partial differential equations (PDE).
- ◦ Parallel and high-performance computing (HPC). Computer graphics and scientific visualization.
- ◦ Game theory simulations with applications to economics, psychology and finance.

Affiliations & Service

American Institute of Aeronautics and Astronautics (AIAA) senior member

Reviewer for the AIAA Journal & Journal of Thermophysics and Heat Transfer

Primary author of Univ. of Minnesota US3D hypersonic flow simulation code.

Primary developer/maintainer of Univ. of Minnesota MGDS v2.0 DSMC flow solver

Faculty adviser and formerly board member of the Hellenic Student Association at the Univ. of Minnesota.

Open-source software advocate and contributor (`http://github.com/nompelis`)

Volunteer driving instructor (ACNA, Northstar BMWCCA, Nordstern PCA)

2022/08/18