NGOC CUONG NGUYEN

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EDUCATION

2001–2005 **National University of Singapore**
Ph.D. in High Performance Computation for Engineered Systems under the program between the Massachusetts Institute of Technology and the National University of Singapore.

1996–2001 **Ho Chi Minh City, University of Technology**
Bachelor of Engineering in Aeronautical Engineering

PROFESSIONAL EXPERIENCE

Since 2014 **Massachusetts Institute of Technology**
Principal Research scientist in the Department of Aeronautics & Astronautics

2008-2014 **Massachusetts Institute of Technology**
Research scientist in the Department of Aeronautics & Astronautics

2005–2008 **Massachusetts Institute of Technology**
Post-doctoral associate in the Department of Aeronautics & Astronautics.

RESEARCH INTERESTS

Numerical methods for partial differential equations, numerical optimization, molecular dynamics, computational fluid dynamics, uncertainty quantification, machine learning, parallel computing.

AWARDS

The first Springer Computational Science and Engineering Prize 2009.

Singapore-MIT Alliance Research Graduate Fellowship, 2001-2005

SELECTED PUBLICATIONS

S. Terrana, N. C. Nguyen, J. Peraire, Large-eddy simulation of transonic buffet using matrix-free discontinuous Galerkin method, To appear in *AIAA Journal*.

M. Solano, S. Terrana, N. C. Nguyen, J. Peraire, An HDG method for dissimilar meshes. To appear in *IMA Journal of Numerical Analysis*.

M, A Sánchez, B. Cockburn, N. C. Nguyen, J. Peraire, Symplectic Hamiltonian finite element methods for linear elastodynamics. *Computer Methods in Applied Mechanics and Engineering*, 381:113843, 2021.

F. Vidal-Codina, N. C. Nguyen, C. Ciracì, S. H. Oh, J. Peraire, A nested hybridizable discontinuous Galerkin method for computing second-harmonic generation in three-dimensional metallic nanostructures. *Journal of Computational Physics*, 429:110000, 2021.

N. Pares, N. C. Nguyen, P. Diez, J. Peraire, A posteriori goal-oriented bounds for the Poisson problem using potential and equilibrated flux reconstructions: Application to the hybridizable discontinuous Galerkin method. *Computer Methods in Applied Mechanics and Engineering*, 386:114088, 2021.

C Guerra-Garcia, N. C. Nguyen, T. Mouratidis, M. Martinez-Sanchez, Corona discharge in wind for electrically isolated electrodes. *Journal of Geophysical Research: Atmospheres*, 125 (16), 2020.

F. Vidal-Codina, L, Martín-Moreno, C. Ciracì, D. Yoo, N. C. Nguyen, S. H. Oh, J. Peraire, Terahertz and infrared nonlocality and field saturation in extreme-scale nanoslits. *Optics Express*, 28 (6),

8701-8715, 2020.

C. Ciucă, P. Fernandez, A. Christophe, N. C. Nguyen, J. Peraire, Implicit hybridized discontinuous Galerkin methods for compressible magnetohydrodynamics. *Journal of Computational Physics: X*, 5:100042, 2020

S. Terrana, N. C. Nguyen, J. Bonet, J. Peraire, A hybridizable discontinuous Galerkin method for both thin and 3D nonlinear elastic structures. *Computer Methods in Applied Mechanics and Engineering* 352:561–585, 2019.

F. Vidal-Codina, J. Saà-Seoane, N. C. Nguyen, J. Peraire, A multiscale continuous Galerkin method for stochastic simulation and robust design of photonic crystals. *Journal of Computational Physics: X*, volume 2, 100016, 2019.

N. C. Nguyen, P. Fernandez, R. M. Freund, J. Peraire, Accelerated residual methods for the iterative solution of systems of equations. *SIAM Journal on Scientific Computing*, 40:3157–3179, 2018.

P. Fernandez, A. Christophe, S. Terrana, N. C. Nguyen, J. Peraire, Hybridized discontinuous Galerkin methods for wave propagation. *Journal of Scientific Computing*, 77:1566–1604, 2018.

F. Vidal-Codina, N. C. Nguyen, J. Peraire, Computing parametrized solutions for plasmonic nanogap structures. *Journal of Computational Physics*, 366:89–106, 2018.

F. Vidal-Codina, N. C. Nguyen, S. H. Oh, J. Peraire, A hybridizable discontinuous Galerkin method for computing nonlocal electromagnetic effects in three-dimensional metallic nanostructures. *Journal of Computational Physics*, 355:548–565, 2018.

D. Yoo, D. A Mohr, F. Vidal-Codina, A. John-Herpin, M. Jo, S. Kim, J. Matson, M. Jo, S. Kim, J. Matson, J. D Caldwell, H. Jeon, N. C. Nguyen, L. Martin-Moreno, J. Peraire, H. Altug, S. H. Oh, High-contrast infrared absorption spectroscopy via mass-produced coaxial zero-mode resonators with sub-10 nm gaps. *Nano letters*, 18(3):1930–1936, 2018.

P. Fernandez, N. C. Nguyen, J. Peraire, The hybridized discontinuous Galerkin method for implicit LES of transitional turbulent flows. *Journal of Computational Physics*, 336:308–329, 2017.

N. C. Nguyen, C. Guerra-Garcia, J. Peraire, M. Martinez-Sanchez, Computational study of glow corona discharge in wind: Biased conductor. *Journal of Electrostatics*, 89:1–12, 2017.

D. Moro, N. C. Nguyen, J. Peraire, M. Drela, Mesh topology preserving boundary-layer adaptivity method for steady viscous flows. *AIAA Journal*, 55:1970–1985, 2017.

C. Guerra-Garcia, N. C. Nguyen, J. Peraire, M. Martinez-Sanchez, Arc reattachment driven by a turbulent boundary layer: implications for the sweeping of lightning arcs along aircraft. *Journal of Physics D: Applied Physics*, 49 (37), 375204, 2016.

N. C. Nguyen, H. Men, R. M. Freund, J. Peraire, Functional regression for state prediction using linear PDE models and observations. *SIAM Journal on Scientific Computing*, 38:247–271, 2016.

D. Yoo, D. N. C. Nguyen, L. Martin-Moreno, D. A. Mohr, S. Carretero-Palacios, J. Shaver, J. Peraire, T. W. Ebbesen, S.-H. Oh, High-throughput fabrication of resonant metamaterials with ultrasmall coaxial apertures via atomic layer lithography. *Nano letters*, 16(3):2040–2046, 2016.

H. Men, R. Freund, N. C. Nguyen, J. Saa-Seoane, J. Peraire, Fabrication-adaptive optimization, with an application to photonic crystal design. *Operations Research*, 62:418–434, 2014 .