RAMI MASRI

Ph.D. Candidate
(updated: December 2, 2021)

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EDUCATION

Ph.D., Computational and Applied Mathematics, May 2022 (expected)
Rice University, Houston, TX
Advisor: Prof. Beatrice Riviere

Graduate Certificate in Teaching and Learning, December 2021 (expected)
Rice University Center of Teaching Excellence, Houston, TX

M.A., Computational and Applied Mathematics, May 2019
Rice University, Houston, TX
Advisor: Prof. Beatrice Riviere

B.S., Mathematics, with high distinction, May 2017
Lebanese American University, Beirut, Lebanon

RESEARCH

Numerical Analysis of Discontinuous Galerkin Methods
Cahn–Hilliard–Navier–Stokes equations
Incompressible Navier–Stokes equations
Elliptic problems with a Dirac line source
Nonlinear convection diffusion equations

Mathematical Modeling
Blood flow and solute transport in vessel networks

PAPERS

R. Masri, C. Liu, B. Riviere. Numerical Analysis of a Decoupled Discontinuous Galerkin Algorithm for the Cahn–Hilliard–Navier–Stokes System. *In preparation*, 2021

R. Masri, C. Liu, B. Riviere. Improved velocity and pressure error estimates for a discontinuous Galerkin pressure correction scheme. *Submitted*, 2021

R. Masri, C. Liu, B. Riviere. A discontinuous Galerkin pressure correction scheme for the incompressible Navier-Stokes equations: stability and convergence. *Submitted*, arXiv: 2109.10999, 2021

R. Masri, C. Puelz, B. Riviere. A discontinuous Galerkin method for blood flow and solute transport in one dimensional vessel networks. *Communications on Applied Mathematics and Computation*, p. 1-30, doi:10.1007/s42967-021-00126-5, 2021

R. Masri, C. Puelz, B. Riviere. A reduced model for solute transport in compliant blood vessels with arbitrary axial velocity profile. *International Journal of Heat and Mass Transfer*, 176, 121379, doi: 10.1016/j.ijheatmasstransfer.2021.121379, 2021

REPORT

N. Berre, G. Castro, H. Kjeldsberg, R. Masri, and I. Gjerde. A computational study on flow instabilities in aneurysms. *SSCP Simula SpringerBrief on Computing: Reports on Computational Physiology* (to appear), 2021

The open source implementation of the above study can be found here:
Kjeldsberg, H., Masri, R., Berre, N., Castro, G., and Gjerde, I. Flowinstabilities. https://doi.org/10.5281/zenodo.5296829, Aug. 2021

THESES

R. Masri. Derivation and numerical simulation of oxygen transport in blood vessels. *Master of Arts Thesis, Rice University*, 2019

TEACHING

Teaching Assistant
CAAM 336, Differential equations in science and engineering
Rice University, Department of Computational and Applied Mathematics
Fall 2019, Spring 2020, Fall 2021

MTH 101–102, Introductory calculus courses
Lebanese American University, Department of Computer Science and Mathematics
Fall 2016, Spring 2017

Grader
CAAM 336, Differential equations in science and engineering,
Rice University, Department of Computational and Applied Mathematics
Fall 2017, Spring 2018

CAAM 453, Numerical Analysis I
Rice University, Department of Computational and Applied Mathematics
Fall 2018

RESEARCH TALKS

Stability and convergence of high order discontinuous Galerkin methods for incompressible flows. *SIAM Texas Louisiana Annual Meeting*, November 2021

One dimensional models of solute transport and blood flow: derivation and numerical simulation. *SIAM Conference on Computational Science and Engineering*, March 2021

Derivation and simulation of blood flow and solute transport models in one dimensional vessel networks. *SIAM Texas Louisiana Annual Meeting*, October 2020

One dimensional models of solute transport and blood flow in vessel networks. *Departmental Graduate Student Seminar at Rice University*, October 2020

Derivation and simulation of a reduced solute transport model in compliant blood vessels with a general velocity field. *Accepted in SIAM Life Sciences*, June 2020. Cancelled due to Covid

Discontinuous Galerkin methods for blood flow and solute transport models. *Finite Element Rodeo at Baylor University*, March 2020

Reduced models of blood flow and solute transport. *Departmental Graduate Student Seminar at Rice University*, January 2020

AWARDS

Student Travel Award, SIAM Texas Louisiana Annual Meeting, 2021

Student Travel Award, SIAM Conference on Computational Science and Engineering, 2021

Alan Weiser Memorial Travel Award, Rice University, 2020

Fulbright Winner, U.S. Embassy in Beirut, 2017

Full Merit Scholarship, Lebanese American University, 2015-2017

National Public Speaking Contest Winner, English Speaking Union, 2016

MENTORSHIP

Graduate Student Peer Mentor
Rice University, Department of Computational and Applied Mathematics, Fall 2021

Leader of Undergraduate Training Sessions

Lebanese American University, Model Arab League, Fall 2018

LEADERSHIP

Graduate Liaison
Center of Teaching Excellence, Fall 2021 - Spring 2022

Vice President
SIAM Student Chapter, Rice University, Fall 2021 - Spring 2022

COMPUTER SKILLS

Languages
Python, C, C++

Software:
MATLAB, LaTeX, FEniCS, ParaView

MEMBERSHIPS

SIAM Student Chapter at Rice University

AWM Student Chapter at Rice University

LANGUAGES

English, Arabic