MOHAMMAD NOORANIDOOST

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CURRENT POSITION

Postdoctoral Scholar *March 2021 - present*
Department of Mathematics
Florida State University, Tallahassee, FL
Mentors: Dr. Nick Cogan & Dr. M. Yousuff Hussaini
Research Area: *Mathematical Modeling of Biofilm Development, Flow Interaction and Parameter Estimation Based on Observational Data*

EDUCATION

Ph.D. in Mechanical Engineering *January 2017 - December 2020*
University of Central Florida, Orlando, FL
Advisor: Dr. Ranganathan Kumar
Dissertation title: *Cell Encapsulation in Microfluidic Channels*

M.Sc. in Mechanical Engineering *September 2013 - August 2016*
Koç University, Istanbul, Turkey
Advisor: Dr. Metin Muradoglu
Dissertation title: *Effects of Viscoelasticity on Droplet Dynamics in Microfluidic Systems*

B.Sc. in Aerospace Engineering *September 2008 - August 2013*
Sharif University of Technology, Tehran, Iran

RESEARCH EXPERIENCE

Postdoctoral Scholar *March 2021 - present*
Department of Mathematics, Florida State University
- Bayesian estimation of model parameters in biofilm mechanics using data assimilation techniques.
- Mathematical modeling of biofilm development, flow interaction, and their rheology.

Graduate Research Assistant *January 2017 - December 2020*
Department of Mechanical Engineering, University of Central Florida
- Conducted a three-phase front-tracking viscoelastic solver to simulate cell dynamics in microchannels.
- Simulated cell encapsulation and migration of encapsulated single cells to study deformation and viability of leukemia cells in constricted microchannels using Newtonian and viscoelastic fluids.
- Simulated droplet formation process in hydrophobic/ hydrophilic microfluidic channels.

Graduate Research Assistant *September 2013 - August 2016*
Department of Mechanical Engineering, Koç University
- Simulated generation of droplets in flow focusing geometries for viscoelastic systems.
- Simulated droplet-based bio-printing systems using a viscoelastic cell epitaxy model.

TEACHING EXPERIENCE

Graduate Teaching Assistant
Department of Mechanical Engineering, University of Central Florida

– EGN 3343 - Thermodynamics — Fall 2017 & Spring 2018.
Conducted one-to-one, score-clarification sessions for a class size of 400 students.
Developed question banks for class demonstrations and formative/summative assessments in Canvas.
Graded quizzes and tests on a weekly basis.

Graduate Teaching Assistant
Department of Mechanical Engineering, Koç University

– MECH 301 - Fluid Mechanics — Fall 2013 & Fall 2016
Conducted review sessions on a weekly basis.
Graded midterm exams and quizzes.

– PHYS 102 - General Physics Lab 2 — Fall 2014 & Fall 2015
Performed demonstrations and helped students with their lab experiments. Graded lab reports.

– PHYS 101 - General Physics Lab 1 — Spring 2014 & Spring 2015
Performed demonstrations and helped students with their lab experiments.
Graded lab reports.

Teaching Assistant
Department of Aerospace Engineering, Sharif University of Technology

– Aerodynamics I — Fall 2012
Taught students how to use Ansys Fluent software and assisted them with their projects.
Designed a course project and graded project reports.

– Mechanics of Materials — Fall 2011
Developed question banks, and graded midterm exams and quizzes.

– Engineering Analysis-Dynamics — Fall 2011
Conducted review sessions, and graded midterm exams and quizzes.

– Engineering Analysis-Statics — Spring 2011
Graded midterm exams and quizzes.

PROFESSIONAL SERVICE

Postdoctoral Association (PDA)
Florida State University

Vice-president — *August 2021-present*
Advisory board member — *May 2021-present*
Co-chair of the Spring Event *"Planning Your Career After a Postdocs"* — *Spring 2022*

Senior Design Showcase Judge
College of Engineering and Computer Science, University of Central Florida

Judged the UCF-CECS Senior design virtual showcase. — *Spring 2021 & Fall 2021*

Mentor
Department of Mechanical Engineering, University of Central Florida

Mentored a PhD student, Bryan Palogan, who was conducting experiments on droplet generation process in microchannels. — *December 2019 - December 2020*

Reviewer

Peer reviewed eight journal articles for Physics of Fluids — *August 2017 - present*

Overleaf Advisor — *February 2022 - present*

PEER-REVIEWED JOURNAL ARTICLES

1. **M. Nooranidoost** & R. Kumar. Deformation of an encapsulated leukemia HL60 cell through sudden contractions of a microfluidic channel. *Micromachines* 12.4 (2021): 355.
2. **M. Nooranidoost** & R. Kumar. Improving viability of leukemia cells by tailoring shell fluid rheology in constricted microcapillary. *Scientific Reports* 10.1 (2020): 1-11.
3. **M. Nooranidoost**, D. Izbassarov, S. Tasoglu & M. Muradoglu. A computational study of droplet-based bioprinting: effects of viscoelasticity. *Physics of Fluids* 31.8 (2019): 081901.
4. **M. Nooranidoost**, M. Haghshenas, M. Muradoglu & R. Kumar. Cell encapsulation modes in a flow focusing microchannel: effects of shell fluid viscosity. *Microfluidics and Nanofluidics* 23.3 (2019): 31.
5. **M. Nooranidoost** & R. Kumar. Geometry effects of axisymmetric flow focusing microchannels for single cell encapsulation. *Materials* 12.17 (2019): 2811.
6. **M. Nooranidoost**, D. Izbassarov & M. Muradoglu. Droplet formation in a flow focusing configuration: effects of viscoelasticity. *Physics of Fluids* 28.12 (2016): 123102.
7. **M. Nooranidoost**, N. G. Cogan, P. Stoodley, E. S. Gloag, & M. Y. Hussaini. Bayesian estimation of *Pseudomonas aeruginosa* viscoelastic properties based on creep response data of mutant strains. *(Submitted to Biophysical Journal)*
8. B. Palogan, **M. Nooranidoost**, R. Kumar & S. Bhattacharya. Single T-junction Formation in a Flow-Focusing Microchannel. *(Submitted to Microfluidics and Nanofluidics)*

CONFERENCE PRESENTATIONS AND PROCEEDINGS

1. **M. Nooranidoost**, N. G. Cogan, & M. Y. Hussaini. Bayesian estimation of Pseudomonas aeruginosa viscoelastic properties. *Bulletin of the American Physical Society*, Chicago, March 14-18 (2022).
2. **M. Nooranidoost** & R. Kumar. Deformation and viability of an encapsulated cell through a microfluidic contraction. *Bulletin of the American Physical Society*, Seattle, November 23-26 (2019).
3. **M. Nooranidoost**, D. Izbassarov & R. Kumar. Cell encapsulation in a flow focusing microchannel: effects of viscoelasticity. *Bulletin of the American Physical Society*, Atlanta, November 18-20 (2018).
4. D. Izbassarov, **M. Nooranidoost** & M. Muradoglu. Effects of viscoelasticity on droplet-based bioprinting. *Bulletin of the American Physical Society*, Atlanta, November 18-20 (2018).
5. **M. Nooranidoost**, M. Haghshenas, M. Muradoglu & R. Kumar. Cell-encapsulating droplet formation in a flow focusing configuration. *Bulletin of the American Physical Society*, Denver, November 19-21 (2017).
6. **M. Nooranidoost**, D. Izbassarov & M. Muradoglu. The effects of viscoelasticity in a microfluidic flow focusing configuration. *6^{th} International Workshop on Bubble and Droplet*, Potsdam/Golm, Germany, July 06-10 (2015).
7. **M. Nooranidoost**, D. Izbassarov & M. Muradoglu. Direct numerical simulations of viscoelastic effects on drop formation in a flow focusing configuration. *International Conference on Advances in Applied and Computational Mechanics*, Izmir, Turkey, August 05-07 (2015).
8. **M. Nooranidoost**, D. Izbassarov & M. Muradoglu. A computational modeling of viscoelastic effects on droplet formation in a flow focusing configuration. *8^{th} Ankara International Aerospace Conference*, Ankara, Turkey, September 10-12 (2015).
9. M. Muradoglu, D. Izbassarov & **M. Nooranidoost**. Computational modeling of soluble surfactant and viscoelasticity in multiphase flows. *Smart and Green Interfaces Conference*, Belgrade, Serbia, March 30 - April 01 (2015).
10. H. Jahandideh, **M. Nooranidoost**, B. Enghiad & A. Hajimirzakhani. Ball striking algorithm for a 3 DOF ping-pong playing robot based on particle swarm optimization. *16^{th} International Conference on System Theory, Control and Computing (ICSTCC)*, Sinaia, Romania, October 12-14 (2012).

INVITED TALK

– **M. Nooranidoost**, Bayesian estimation of Pseudomonas aeruginosa viscoelastic properties. *Biomathematics Graduate Seminar*, Florida State University , October 20 (2021).

POSTER PRESENTATION

– **M. Nooranidoost**, , N. G. Cogan, & M. Y. Hussaini. A Bayesian Approach to study Pseudomonas aeruginosa viscoelasticity. *The Mathematics of Soft Matter*, IMSI institute (virtual), February 28 - March 4 (2022)

VIRTUAL CONFERENCES AND WORKSHOPS ATTENDED

These exclude those conferences/workshops for which a talk/poster was listed above.

– A Short Course in Systems Biology, UCI Center for Complex Biological Systems *August 2021*
– Montana Biofilm Meeting, Center for Biofilm Engineering *July 2021*
– SIAM Annual Meeting 2021, Society for Industrial and Applied Mathematics *July 2021*
– SMB2021 Annual Meeting, Society for Mathematical Biology *June 2021*

PROFESSIONAL CERTIFICATIONS

Preparing Tomorrow's Faculty
University of Central Florida

– Completed a twelve-week, face-to-face certificate program, offered by *The Faculty Center for Teaching & Learning*, that aims to prepare future and academic leaders to teach at collegiate level.
– Designed syllabus and course materials for an undergrad level course (EML 3701 - Fluid Mechanics).

Advanced PIE Teaching Training Recognition
Florida State University

– A two-semester online training series, offered by *The Program for Instructional Excellence (PIE)*, that consists of six content units: Developing a course syllabus; Knowing your teaching environment; Using Blackboard for introduction; Planning teaching-learning activities; Student assessment; and Course evaluation and revision.

Diversity & Inclusion Certificate
Florida State University

– A series of six sessions offered by *Diversity & Inclusion Council*, that aims for individuals to explore strategic areas around diversity and to learn more about the ways in which they can assist in creating a welcoming and inclusive campus for all.

AREAS OF EXPERTISE

Technical Expertise

– Mathematical modeling, Inverse problems, Markov chain Monte Carlo Monte method, Physical/theoretical CFD model development, Discretization and implementation of numerical schemes, Interfacial flows, Front-tracking method, Rheological flows, Microfluidics, Level-set method, Technical writing.

Computer Expertise

– FORTRAN, MATLAB, Python, OpenFOAM, COMSOL Multiphysics, Ansys Fluent, Linux, LaTeX, Microsoft Office

HONORS AND AWARDS

- Postdoctoral Scholars Career Development Travel Awards in 2022.
- UCF College of Science and Engineering scholarship during doctoral program.
- UCF Student Government Association travel funding in 2018 & 2019.
- Presentation Fellowship to attend APS-DFD meetings in 2017, 2018 & 2019.
- UCF Open Access Publishing Fund in 2020.
- TUBITAK full scholarship during master's program for computational modeling of non-Newtonian drops in biological flows, No.112M181.
- Koç University research award in Spring 2015.
- COST action MP1106 travel grant in Spring 2015.
- Ranked amongst the top 1% of the Iranian National Mathematics and Physics Olympiad in 2004 and 2006, respectively

PROFESSIONAL MEMBERSHIPS

- American Physical Society (APS).
- American Society of Mechanical Engineers (ASME).
- Society of Industrial and Mathematics (SIAM).

LANGUAGES

- Farsi: Native
- English: Fluent