Pejman Sanaei

CONTACT
INFORMATION

New York University
Courant Institute of Mathematical Sciences
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RESEARCH
INTERESTS

Mathematical Modeling, Fluid Dynamics, Industrial Mathematics, Filtration,
Biological Fluid Dynamics

EDUCATION

- **New Jersey Institute of Technology (NJIT)**
  - Ph.D. candidate, Mathematical Sciences (2013-2017, **GPA 4.0**).
    * Dissertation Topic: Mathematical Modeling of Membrane Filtration.
    * Advisor: **Professor Linda J. Cummings.**
  - M.S. in Applied Statistics (2016-2017, **GPA 4.0**).

- **Shiraz University, Iran**
  - M.S. in Pure Mathematics, September 2009.
    * Dissertation Topic: Geometric and Manifold for Independent Component Analysis.
  - B.S. in Mechanical Engineering, June 2006.
    * Dissertation Topic: Modeling of Tall Buildings in Wind by Fluent.

ACADEMIC
POSITIONS

- **Courant Institute of Mathematical Sciences (CIMS), New York University (NYU), New York.**
  - Assistant Professor/Courant Instructor (September 2017-present).
- **Courant Institute of Mathematical Sciences, New York University, New York.**
  - Adjunct Professor (July-August 2017).

ACCEPTED
ARTICLES

- *Modeling Flow and Fouling in Membrane Filters with Complex Pore Morphology*,
  P. Sanaei, L.J. Cummings, submitted to Journal of Fluid Mechanics, (2017).
- *Flow and Fouling in Membrane Filters: Effects of Membrane Morphology*,
  P. Sanaei, L.J. Cummings, Journal of Fluid Mechanics, 818, 744-771 (2017).
- *Flow and Fouling in a Pleated Membrane Filter*,
  P. Sanaei, G.W. Richardson, T. Witelski, L.J. Cummings, Journal of Fluid Mechanics, 795, 36-59 (2016).
- *Bee Algorithm for Solving Resource Constrained Project Scheduling Problem*,
  P. Sanaei, V. Zeighami, R. Akbari, S. Shams, 8th International Project Management Conference, Tehran, Iran (2012).
- *Using Firefly Algorithm to Solve Resource Constrained Project Scheduling Problem*,
  P. Sanaei, V. Zeighami, R. Akbari, S. Shams, Proceedings of Seventh International Conference on Bio-Inspired Computing: Theories and Applications (BIC-TA 2012).
- *Solutions to Precalculus Problems*,
  P. Sanaei, I. Habibi, F. Keshavarz, Avande Andishe Publications (2007).

ARTICLES IN
PREPRATION

- *Membrane Filtration with Multiple Fouling Mechanisms*,
  P. Sanaei L.J. Cummings (Preprint).

- *Curvature- and Fluid Stress Driven Tissue Growth in a Tissue Engineering Scaffold Pore*,
  P. Sanaei, L.J. Cummings, I.M. Griffiths, S.L. Waters (Preprint).

- *Particle Diffusion Effect in Membrane Filters*,
  P. Sanaei, L.J. Cummings (Manuscript in preparation).

- *Comparing a Continuum and a Network Mathematical Model for Membrane Filters*,
  P. Sanaei, L.J. Cummings, I.M. Griffiths (Manuscript in preparation).

- *Stochastic Approach to Model Fouling in Membrane Filters with Complex Pore Morphology*,
  B. Gu, **P. Sanaei**, L. Kondic, L.J. Cummings (Manuscript in preparation).

- *Flow and Fouling in Multi-Layered Membrane Filters*,
  P. Sanaei, D. Fong, S.J. Chapman, L.J. Cummings (Manuscript in preparation).

- *On Temperature Effects in Reacting Porous Media Applications*,
  P. Sanaei, B. Gu, R.H. Allaire, B.S. Tilley (Manuscript in preparation).

- *Cell Migration in Microfluidic Mazes*,
  P. Sanaei, L.J. Cummings, Q.L. Pham (Manuscript in preparation).

- *Modeling for Pleated Filter*,
  Y. Sun, **P. Sanaei**, L. Kondic, L.J. Cummings (Manuscript in preparation).

ABSTRACTS

- *Modeling Filtration and Fouling with a Microstructured Membrane Filter*,
  L.J. Cummings, **P. Sanaei**, Bulletin of the American Physical Society, 2017.

- *Stochastic Approach to Model Fouling in Membrane Filters with Complex Pore Morphology*,
  P. Sanaei, B. Gu, L. Kondic, L.J. Cummings, Bulletin of the American Physical Society, 2017.

- *Curvature and Stress Driven Tissue Growth in a Tissue Engineering Scaold Pore*,
  P. Sanaei, L.J. Cummings, I.M. Griffiths, S.L. Waters, APS-CAM Conference, 2017.

- *Fouling of a Filter Membrane with Complex Microstructure: A Simplified Mathematical Model*,
  P. Sanaei, L.J. Cummings, SIAM Annual Meeting, 2017.

- *Modeling Flow and Fouling in Membrane Filters: Insights into Filter Design*,
  P. Sanaei, L.J. Cummings, SIAM Annual Meeting-Student Days Talks, 2017.

- *Mathematical Modeling of Pleated Membrane Filters*,
  P. Sanaei, G.W. Richardson, T. Witelski, L.J. Cummings, SIAM-CSE 2017.

- *Optimizing Internal Structure of Membrane Filters*,
  L.J. Cummings, **P. Sanaei**, Bulletin of the American Physical Society, 2016.

- *Modeling Branching Pore Structures in Membrane Filters*,
  P. Sanaei, L.J. Cummings, Bulletin of the American Physical Society, 2016.

- *Optimum Permeability Profile and Fouling in Membrane Filters*,
  P. Sanaei, L.J. Cummings, SIAM Annual Meeting, 2016.

- *Flow and fouling in Membrane Filters: Effects of Membrane Morphology*,
  P. Sanaei, L.J. Cummings, Bulletin of the American Physical Society, 2015.

- *Simplified Model for Fouling of a Pleated Membrane Filter*,
  P. Sanaei, L.J. Cummings, Bulletin of the American Physical Society, 2014.

TECHNICAL REPORTS

- *On Characterizing and Simulating Porous Media*,
  The Mathematical Problems in the Industry workshop (MPI), NJIT 2017.
  https://web.njit.edu/~rmoore/MPI2017/finalReports/gore17.pdf

- *On characterizing and Simulating Porous Media*,
  The Mathematical Problems in the Industry workshop (MPI), Duke University 2016.
  http://services.math.duke.edu/conferences/mpi2016/

- *Flooding in Porous Media*,
  The Mathematical Problems in the Industry workshop (MPI), University of Delaware 2015.
  https://www.mathsci.udel.edu/content-sub-site/Documents/MPI%202015/Gore.pdf

- *Effects of Membrane Morphology on Separation Efficiency*,
  The Mathematical Problems in the Industry workshop (MPI), NJIT 2014.
  https://web.njit.edu/~rmoore/MPI2014/finalReports/MPI_Proceedings_LJC.pdf

INVITED TALKS

- *tochastic Approach to Model Fouling in Membrane Filters with Complex Pore Morphology,*,
  New York University, Courant Institute of Mathematical Sciences (November 2017).

- *Mathematical modeling of Tissue Engineering*,
  New York University, Courant Institute of Mathematical Sciences (October 2017).

- *Mathematical Modeling of Membrane Filtration*,
  The City College of New York (Levich Institute) (October 2017).

- *Mathematical Modeling of Membrane Filtration*,
  New York University, Courant Institute of Mathematical Sciences (July 2017).

- *Mathematical Modeling of Membrane Filtration*,
  University of Delaware (UD), Mathematical Problems in Industry (MPI) Fellow Talk (June 2015).

CONFERENCE TALKS

- *Internal Structure and Morphology Profile in Optimizing Filter Membrane Performance*,
  Frontiers in Applied and Computational Mathematics (FCAM), (NJIT, June 2017).

- *Mathematical Modeling of Membrane Filtration*,
  Graduate Student Seminar (NJIT, June 2017).

- *The Effect of Scaffold Morphology on Tissue Growth*,
  The 7th Northeast Complex Fluids and Soft Matter Workshop (NCS7) (Princeton University, May 2017).

- *Modeling Complex Internal Geometry of Membrane Filters*,
  Dana Knox Student Research Showcase (NJIT, April 2017).

- *Curvature and Stress Driven Tissue Growth in a Tissue Engineering Scaffold*,
  Applied Math Days (Rensselaer Polytechnic Institute (RPI), April 2017).

- *Modeling Branching Pore Structures in Membrane Filters*,
  The 6th Northeast Complex Fluids and Soft Matter Workshop (NCS6) (Stevens Institute of Technology, January 2017).

- *Flow and fouling in Membrane Filters: Effects of Membrane Morphology*,
  The 69th New England Complex Fluids Workshop (Boston, December 2016).

- *Investigating the Performance of Pleated Membrane Filters*,
  Gene Golub SIAM Summer School, poster presentation (Drexel, August 2016).

- *Investigating the Performance of Pleated Membrane Filters*,
  Frontiers in Applied and Computational Mathematics (FACM), poster presentation (NJIT, June 2016).

- *Models for Membrane Filtration*,
  Graduate Student Seminar (NJIT, May 2016).
- *Optimum Pore Profile and Fouling in Membrane Filters*,
  Dana Knox Student Research Showcase (NJIT, April 2016).
- *Permeability Profile in Optimization Filter Membrane Performance*,
  Applied Math Days (Rensselaer Polytechnic Institute (RPI), April 2016).
- *Optimum Permeability Profile and Fouling in Membrane Filters*,
  The 5th Northeast Complex Fluids and Soft Matter Workshop (NCS5) (New York University Tandon, School of Engineering, January 2016).
- *Flow and Fouling in a Pleated Membrane Filter*,
  Graduate Student Association (GSA) Research Day (NJIT, October 2015).
- *Flow and Fouling in a Pleated Membrane Filter*,
  The 4th Northeast Complex Fluids and Soft Matter Workshop (NCS4) (Stony Brook University, June 2015).
- *Mathematical Modeling of Membrane Filtration*,
  Graduate Student Seminar (NJIT, June 2015).
- *Effect of Filter Membrane Morphology on Separation Efficiency*,
  Frontiers in Applied and Computational Mathematics (FACM), poster presentation (NJIT, May 2015).
- *Flow and Fouling in a Pleated Membrane Filter*,
  Dana Knox Student Research Showcase (NJIT, April 2015).
- *Effect of Filter Membrane Morphology on Separation Efficiency*,
  Applied Math Days (Rensselaer Polytechnic Institute (RPI), April 2015).
- *Effect of Filter Membrane Morphology on Separation Efficiency*,
  NCS3 (NJIT, January 2015).
- *Simplified Model for Fouling of a Pleated Membrane Filter*,
  Graduate Student Seminar (NJIT, July 2014).

WORKSHOPS &
CONFERENCE

- *Gene Golub SIAM Summer School* (Drexel University, July–August 2016).
- *MPI* (NJIT, UD, Duke University and NJIT June 2014, 2015, 2016 and 2017).
- *FACM* (NJIT, May 2013, 2014, 2015, 2016, 2017).
- *Waves, Spectral Theory, & Applications* (Princeton University, September 2015).
- *Graduate Student Mathematical Modeling Camp (GSMMC)* (RPI, June 2013).

SYNERGISTIC
ACTIVITIES

- Organizer for Applied Math and Applied Math Lab seminars, Courant Institute of Mathematical Sciences, New York University (2017-2018).
- Mentoring, with my Ph.D. advisor, two Ph.D. students (Yixuan Sun and Binan Gu) at NJIT (2016-present).
- Minisymposium Organizer, SIAM Conference on Computational Science and Engineering (SIAM-CSE), Atlanta, Georgia (February–March 2017).
- Member of NJIT GSA Travel Award Committee Panel.
- Vice president of NJIT PhD Student Club (2016-2017).
- President of NJIT SIAM Student Chapter (2016-2017).
- President of Graduate Student Math Club at NJIT (2016-2017).
- Organizer for graduate students summer talks for DMS (2016).
- Captain of NJIT Math Club soccer team (2016).

TEACHING
EXPERIENCE

LECTURER:

- Numerical Analysis, NYU, Spring 2018.
- Numerical Analysis, NYU, Fall 2017.
- Math For Economics II, NYU, Summer 2017 (Evaluation score: 3.9/5).
- Calculus III, NJIT, Spring 2017 (Evaluation score: 3.6/4).
- Calculus II, NJIT, Fall 2016 (Evaluation score: 3/4).
- Linear Algebra, NJIT, Fall 2015 (Evaluation score: 3.1/4).
- Differential Equations, NJIT, Spring 2015 (Evaluation score: 3.3/4).
- Calculus I, II, Iran, 2011-2012.
- Mathematics Olympiad, Iran, 2000-2012.

TEACHING ASSISTANT:

- Calculus I, II, Advanced Engineering Mathematics, Ordinary Differential Equations, Linear Control, Vibration Theory, Complex Analysis, Number Theory, Water Transfer Systems, Combinatorial Mathematics.

HONORS AND
AWARDS

Year	Award
2017	APS-CAM Conference Travel Award
2017	SIAM Annual Meeting Student Travel Award
2017	SIAM-CSE Student Travel Award
2016	NJIT Ahluwalia Fellowship Award
2016	NJIT GSA Research Day Award
2016	Gene Golub SIAM Summer School Travel Award
2016	NJIT GSA Conference Travel Award
2016	NJIT Class of '58 Fellowship Award
2015	NJIT Ahluwalia Fellowship Award
2015	NJIT GSA Research Day Award
2015	NJIT GSA Conference Travel Award
2014	APS-DFD Conference Travel Award
2014	MPI Workshop, Graduate Fellowship (NSF Grant DMS-1261596)
2014	NJIT Provost Doctoral Award.
2013	NJIT Provost Doctoral Award.
2006	36th rank in National Mathematical Olympiad Contest in Iran.
2001	Top 0.1% rank among 1000000 in National Entrance Exam in Iran.
1997	Selected for National Organization for Development of Exceptional Talents (NODET), Iran.

PROFESSIONAL
SOCIETIES

- American Physical Society (APS).
- Society for Industrial and Applied Mathematics (SIAM).
- American Mathematical Society (AMS).
- American Association for the Advancement of Science (AAAS).

GRADUATE COURSEWORK	❏ Numerical Methods I, II	❏ Real Analysis
	❏ Complex Variables	❏ Complex Analysis
	❏ Advanced Applied Math-Modeling	❏ Functional Analysis
	❏ Advanced Applied Math I, II, III	❏ Harmonic Analysis
	❏ Asymptotic Methods I, II	❏ Advanced Abstract Algebra
	❏ Advanced Scientific Computing	❏ Geometry of Manifolds
	❏ Mathematical Fluid Dynamics I	❏ Special Topics in Dynamical Systems
	❏ Special Topics in PDE	❏ Methods for Statistical Consulting
	❏ Probability Distributions	❏ Design and Analysis of Experiments
	❏ Regression Analysis	❏ Stochastic Processes with Applications
	❏ Statistical Inference	❏ Introduction To Biostatistics

EXTRACURRICULAR ACTIVITIES

- Organizer and team member for DMS graduate student association soccer games.
- Member of chess club at Shiraz University.
- Playing piano.

RELEVANT SKILLS

- Computer Languages: Matlab, C++, R, R Studio.
- Tools: LaTex, Microsoft Office, Fluent, AutoCAD, Minitab, Mathematica.

REFERENCES

- **Linda J. Cummings**, Professor of Mathematical Sciences, New Jersey Institute of Technology, (973)-596-5479, `linda.cummings@njit.edu`.
- **Lou Kondic**, Professor of Mathematical Sciences, New Jersey Institute of Technology, (973)-596-2996, `lou.kondic@njit.edu`.
- **Ian Griffiths**, Research Fellow of Mathematical Institute, University of Oxford, +44 1865 615139, `Ian.Griffiths@maths.ox.ac.uk`.
- **Thomas P. Witelski**, Professor of Mathematics and Pratt School of Engineering, Duke University, (919) 660-2841, `witelski@math.duke.edu`.
- **Leif Ristroph**, Assistant Professor of Mathematics, Courant Institute of Mathematical Sciences, New York University, (212) 998-3317, `ristroph@cims.nyu.edu`
- **Michael J. Shelley**, Professor of Mathematics, Courant Institute of Mathematical Sciences, New York University, (212) 998-3284, `shelley@cims.nyu.edu`