Souvik Roy

Assistant Professor,
University of Texas at Arlington, USA
SEIR 219

September 6, 2021

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Professional Experience

- **University of Texas at Arlington (UTA)** — Arlington, Texas, USA
  Assistant Professor — *August, 2018 – present*
- **Tata Institute of Fundamental Research, Centre for Applicable Mathematics (TIFR-CAM)** — Bangalore, India
  Visiting fellow — *March, 2018 – July, 2018*
- **University of Würzburg** — Würzburg, Germany
  Postdoctoral fellow — *Sep, 2016 – Sep, 2017*
- **International Centre for Theoretical Sciences (ICTS) and University of Nice** — Bangalore India / Nice, France
  Joint postdoctoral fellow — *Jan, 2016 – August, 2016*
- **University of Würzburg** — Würzburg, Germany
  Postdoctoral fellow — *July, 2015 – Dec, 2015*
- **University of Texas at Arlington** — Texas, USA
  Postdoctoral fellow — *Jan, 2015 – May, 2015*
- **University of Würzburg** — Würzburg, Germany
  Deutscher Akademischer Austauschdienst (DAAD) visiting scientist — *Oct 2014 – Dec 2014*

Education

- **Tata Institute of Fundamental Research, CAM** — Bangalore, India
  Ph.D. Mathematics — *2011 – 2015*
  - Dissertation title: Reconstruction of a class of fluid flows by variational methods and inversion of integral transforms in tomography.
  - Advisors: A. S. Vasudeva Murthy, Praveen Chandrashekar and Venkateswaran P. Krishnan.

- **Tata Institute of Fundamental Research, CAM** — Bangalore, India
  M.Phil. Mathematics — *2010 – 2011*
  - Thesis title: Optical Flows – Determination of 2D velocities of a moving fluid.
  - Advisors: A. S. Vasudeva Murthy and Praveen Chandrashekhar.

- **Tata Institute of Fundamental Research, CAM** — Bangalore, India
  M.Sc. Mathematics — *2008 – 2010*
  - Graduated with 1st rank and a 79.25% score.

- **Ramakrishna Mission Vidyamandira, Belur Math** — West Bengal, India
  University of Calcutta — *2005 – 2008*
  B.Sc. Mathematics
  - Graduated with 4th rank and a 82.5% score.

Current Research Interests

- Inverse problems and optimal control in medical imaging and health sciences.

- Pharmacokinetic modeling and control for treatment of cancer.

- Computational ordinary and partial differential equations

- Numerical methods for fluid flows.

- Shape optimization.

Grants

Awarded

1. **PI (along with Co-PI Zui Pan)**:
   Interdisciplinary Research Program, University of Texas at Arlington,
   Grant number: 2021-772, Amount: $20,000.
   Title: "A Data-Driven Computational Pharmacokinetic Framework for EGFR-Targeting Therapy
   in Esophageal Cancer". Sep, 2021 – Aug, 2022

2. **Multi-PI (MPI) (along with MPI Suvra Pal and MPI Leili Shahriyari)**:
   National Cancer Institute-National Institutes of Health (NCI-NIH),
   Grant number: 1R21CA242933-01, Amount: $386,767 (UTA amount: $116,160).
   Title: "Data-driven QSP software for personalized colon cancer treatment". Sep, 2019 – Aug, 2021

3. **PI**: *H.C. Ørsted COFUND grant (under Marie Sklodowska-Curie Actions grant no. 609405 (FP7)
   and 713683 (H2020))* for postdoctoral studies at Denmark Technical University, approx.
   Amount: $151,210.
   Title: "Optimization methods for hybrid inverse problems". Oct, 2017 – Sep, 2019
   (S. Roy declined the offer due to accepting the UTA assistant professor position).

Pending

1. **PI**:
   National Science Foundation, Division of Mathematical Sciences (NSF-DMS),
   Amount: $413,361. Apr, 2022 – Mar, 2027
   Title: "CAREER: Mathematical frameworks for control of stochastic signaling pathway dynamics
   in cardiovascular diseases".

2. **Co-PI (PI: Hristo Kojouharov)**:
   National Science Foundation, Division of Mathematical Sciences (NSF-DMS),
   Amount: $1,648,265. Sep, 2021 – Aug, 2026
   Title: "RTG: Vertically integrated interdisciplinary training in mathematics for human health".

3. **Co-PI (along with PI Suvra Pal)**:
   National Science Foundation, Division of Mathematical Sciences (NSF-DMS),
   Amount: $291,744. Jun, 2022 – May, 2025
   Title: "Statistical and Computational Aspects of Novel Machine Learning-Based Cure Models in
   High-Dimensional Setup".

4. **Multi-PI (MPI) (along with MPI Zui Pan, Co-I Benito Chen, Co-I Hristo Kojouharov, Co-I Suvra Pal and Co-I David Wang)**:
   National Cancer Institute-National Institutes of Health (NCI-NIH),
   Amount: $395,510.   Apr, 2022 – Mar, 2024
   Title: "The development of a data-driven computational pharmacokinetic software for RTK-targeting therapy in esophageal cancer".

5. **PI (along with Co-PI Hristo Kojouharov, Co-PI Zui Pan and Co-PI Suvra Pal)**:
   National Science Foundation, Division of Mathematical Sciences (NSF-DMS),
   Amount: $354,459.   Sep, 2022 – Aug, 2025
   Title: "A new stochastic mathematical framework to study the dynamics of calcium signaling pathways and associated therapies in esophageal cancer".

Awards and Honors

- Selected as a member of the prestigious NASDC course "Utah Advanced Course on Mentoring, Leadership, and Cancer-related Health Disparities".   January 2021

- Selected as a member of the prestigious NCI-NIH Innovation Lab "Advancing Cancer Biology at the Frontiers of Machine Learning and Mechanistic Modeling".   August, 2020

- Certified Leader in Education, NRI Welfare Society of India and Association of Leaders in Education.
  April, 2019

- University of Texas at Arlington Freshman Leaders on Campus Honored Professor.   March, 2019

- SIAM travel award for attending the Gene Golub SIAM Summer School, Austria.   Aug, 2014

- Ranked 1st in the M.Sc exams at Tata Institute of Fundamental Research, CAM.   2008 – 2010

- Ranked 4th in the B.Sc. exams at University of Calcutta.   2005 – 2008

- Ranked 71st (out of more than 10000 participants) in the National Science Olympiad, India.   2004

Fellowships

- Postdoctoral fellowship under Deutsche Forschungsgemeinschaft (DFG) grant at University of Würzburg, Germany.   Sep, 2016 – Sep, 2017

- Indo-French Centre for Applied Mathematics (IFCAM) visiting scientist fellowship for postdoctoral studies at University of Nice, France.   April, 2016 – June, 2016

- International Centre For Theoretical Sciences postdoctoral fellowship.   Jan, 2016 – August, 2016

- Postdoctoral fellowship under the project "Multi-ITN Strike" at University of Würzburg, Germany.
  July, 2015 – Dec, 2015

- University of Texas at Arlington and AIRBUS fellowship for postdoctoral studies at University of Texas at Arlington   Jan, 2015 – May, 2015

- Deutscher Akademischer Austauschdienst (DAAD) visiting scholar fellowship for research visit to University of Würzburg, Germany.   Oct, 2014 – Dec, 2014

- Tata Institute of Fundamental Research, CAM doctoral fellowship.   2010 – 2015

- Tata Institute of Fundamental Research, CAM masters fellowship.   2008 – 2010

Publications, Abstracts and Reports

Submitted Publications

1. **Souvik Roy**. A new nonlinear sparse optimization framework for superior reconstructions in ultrasound-modulated optical tomography, *(under review)*, 2021.

2. Suvra Pal, Zui Pan and **Souvik Roy**. A stochastic framework for parameter estimation and uncertainty quantification in colon cancer-induced angiogenesis, *(under review)*, 2021.

3. Yan Chang, Marah Funk, **Souvik Roy**, Elizabeth Stephenson, Sangyong Choi, Hristo Kojouharov, Benito Chen and Zui Pan. Experimental and mathematical models of intracellular calcium dynamics for evaluating combined anticancer effects of Afatinib and RP4010 in esophageal cancer, *(under review)*, 2021.

4. Madhu Gupta, John M Slezak, Fawaz Alalhareth, **Souvik Roy** and Hristo Kojouharov. Second-order modified nonstandard Runge-Kutta and theta methods for one-dimensional autonomous differential equations, *(under review)*, 2021.

5. Fawaz Alalhareth, John M Slezak, Madhu Gupta, **Souvik Roy** and Hristo Kojouharov. Second-order modified positive and elementary stable nonstandard numerical methods for one-dimensional autonomous differential equations, *(under review)*, 2021.

Peer-reviewed Publications

1. Jan Bartsch, Alfio Borzì, Francesco Fanelli and **Souvik Roy**. A numerical investigation of Brockett's ensemble optimal control problems. *Numerische Mathematik (to appear)*, 2021.

2. Yan Chang, **Souvik Roy** and Zui Pan. Store-Operated Calcium Channels as Drug Target in Gastroesophageal Cancers. *Frontiers in Pharmacology*, 2021.

3. **Souvik Roy**, Suvra Pal, Achyuth Manoj, Susanth Kakarla, Juan Villegas and Mesfer Alajmi. A Fokker-Planck framework for parameter estimation and sensitivity analysis in colon cancer. *AIP Conference Proceedings (to appear)*, 2021.

4. Anisa M. H. Chorwadwala and **Souvik Roy**, Placement of an obstacle for optimizing the fundamental eigenvalue of divergence form elliptic operators. *Variational Methods in Mechanics, P. M. Mariano Editors., series "Advances in Continuum Mechanics", Birkhauser-Springer, Boston, (in print)*, 2021.

5. Rim Gouia-Zarrad, **Souvik Roy** and Sunghwan Moon. Numerical inversion and uniqueness of a spherical Radon transform restricted with a fixed angular span, *Applied Mathematics and Computation*, 408(1):126338, 2021.

6. Madhu Gupta, Rohit Kumar Mishra and **Souvik Roy**. Sparsity-based nonlinear reconstruction of optical parameters in two-photon photoacoustic computed tomography, *Inverse Problems*, 37:044001, 2021.

7. Suvra Pal and **Souvik Roy**. On the estimation of destructive cure rate model: a new study with exponentially weighted Poisson competing risks *Statistica Nearlandica*, 75(3): 324–342, 2021.

8. Madhu Gupta, Rohit Kumar Mishra and **Souvik Roy**. Sparse reconstruction of log-conductivity in current density impedance tomography. *Journal of Mathematical Imaging and Vision*, 62:189-205, 2020.

9. Hristo Kojouharov, **Souvik Roy**, Madhu Gupta, Fawaz Alalhareth and John M Slezak. A second-order nonstandard theta method for autonomous differential equations, *Applied Mathematics Letters*, 112:106775, 2020.

10. Suvra Pal and **Souvik Roy**. A new non-linear conjugate gradient algorithm for destructive cure rate model and a simulation study: illustration with negative binomial competing risks, *Communications in Statistics - Simulation and Computation*, doi: 10.1080/03610918.2020.1819321, 2020.

11. **Souvik Roy**. A sparsity-based Fokker-Planck optimal control framework for modeling traffic flows, *AIP Conference Proceedings*, 2302:110007, 2020.

12. Madhu Gupta, Fawaz Alalhareth, John M Slezak, **Souvik Roy** and Hristo Kojouharov. Second-order nonstandard explicit Euler method, *AIP Conference Proceedings*, 2302:110003, 2020.

13. Anisa M.H. Chorwadwala and **Souvik Roy**. How to place an obstacle having a dihedral symmetry centered at a given point inside a disk so as to optimize the fundamental Dirichlet eigenvalue. *Journal of Optimization Theory and Applications*, 184(1):162-187, 2020.

14. Jan Bartsch, Alfio Borzì, Francesco Fanelli and **Souvik Roy**. A theoretical investigation of Brockett's ensemble optimal control problems. *Calculus of Variation and Partial Differential Equations*, 58:162, 2019.

15. **Souvik Roy**, Mario Annunziato, Alfio Borzì and Christian Klingenberg. A Fokker-Planck approach to control collective motion. *Computational Optimization and Applications*, 69(2):423–459, 2018.

16. Gaik Ambartsoumian, Rim Gouia-Zarrad, Venkateswaran P. Krishnan and **Souvik Roy**. Image reconstruction from radially incomplete spherical Radon data. *European Journal of Applied Mathematics*, 29(3):470–493, 2018.

17. **Souvik Roy** and Alfio Borzì. A new optimisation approach to sparse reconstruction of log-conductivity in acousto-electric tomography. *SIAM Journal of Imaging Sciences*, 11(2):1759–1784, 2018.

18. Bolaji Adesokan, Kim Knudsen, Venkateswaran P. Krishnan and **Souvik Roy**. A fully non-linear optimization approach to acousto-electric tomography. *Inverse Problems*, 34:104004, 2018.

19. **Souvik Roy**, Alfio Borzì and Abderrahmane Habbal. Pedestrian motion constrained by FP-constrained Nash games. *Royal Society Open Science*, 4(9):170648, 2017.

20. Praveen Chandrashekar, **Souvik Roy** and A. S. Vasudeva Murthy. A variational approach to estimate incompressible fluid flows. *Proceedings of Mathematical Sciences, Springer*, 127(1):175–201, 2017.

21. **Souvik Roy** and Alfio Borzì. Numerical investigation of a class of Liouville control problems. *Journal of Scientific Computing*, 73(1):178–202, 2017.

22. Gaik Ambartsoumian and **Souvik Roy**. Numerical inversion of a broken ray transform arising in single scattering optical tomography. *IEEE Transactions on Computational Imaging*, 2(2):166–173, 2016.

23. **Souvik Roy**, Mario Annunziato and Alfio Borzì. A Fokker–Planck feedback control-constrained approach for modelling crowd motion. *Journal of Computational and Theoretical Transport*, 45(6):452–458, 2016.

24. **Souvik Roy**, Venkateswaran P. Krishnan, Praveen Chandrasekhar and A. S. Vasudeva Murthy. An efficient numerical algorithm for Radon transform inversion with applications in ultrasound imaging. *Journal of Mathematical Imaging and Vision, Springer*, 53:78–91, 2015.

25. **Souvik Roy**, Praveen Chandrashekar and A. S. Vasudeva Murthy. A variational approach to optical flow estimation of unsteady incompressible flows. *International Journal of Advances in Engineering Sciences and Applied Mathematics, Springer*, 7(3):149–167, 2015.

Conference Proceedings (Not Peer-reviewed)

1. Gaik Ambartsoumian, **Souvik Roy**, Gaurav Khatri and Phillipe Zimmern. Automatic segmentation and 3D visualization of pelvic mesh using mathematical modelling and machine learning techniques in MRI, *Neurology and Urodynamics, ICS 49th Annual Meeting*, 38:S54-S55, 2019.

2. Gaurav Sharma and **Souvik Roy**. Bubble drag coefficient formulation and stability analysis for multiphase-turbomachinery problems (Shear flow/breakup GE2), *Modeling week and study group meeting on industrial problems*, Supercomputer Education Research Center, Indian Institute of Science, Bangalore, India, 58-73, 2011.

3. Andrew A. Lacey, A. S. Vasudeva Murthy, **Souvik Roy** and Arnab Jyoti Dasgupta. Fish feeding. *Modeling week and study group meeting on industrial problems*, Supercomputer Education Research Center, Indian Institute of Science, Bangalore, India, 32-55, 2011.

Technical Reports, Book Reviews and Dissertations

1. Carlos Chan, Mahsa Dabagh, Dave Fuller, Sara Gosline and **Souvik Roy**. Personalized prediction of treatment response for peritoneal carcinomatosis via a hybrid mechanistic/AI approach, *Technical Report, Advancing Cancer Biology at the Frontiers of Machine Learning and Mechanistic Modeling*, NCI-NIH Innovation Lab, 2020.

2. **Souvik Roy** Review of Handbook of Numerical Methods for Hyperbolic Problems: Basic and Fundamental Issues (Rémi Abgrall and Chi-Wang Shu), *SIAM Reviews*, 60(3):768-771, 2018.

3. **Souvik Roy**. Reconstruction of a class of fluid flows by variational methods and inversion of integral transforms in tomography. *Doctoral Dissertation*, TIFR-CAM, 2015.

4. **Souvik Roy**. Optical Flows – Determination of 2D velocities of a moving fluid. *M.Phil Dissertation*, TIFR-CAM, 2011.

Selected List of Invited Presentations

1. **A new nonlinear sparse optimization framework for ultrasound-modulated optical tomography (30 min)**
   Mini-symposium talk at SIAM Texas-Louisiana Conference   *November, 2021*

2. **A projected non-linear conjugate gradient algorithm for parameter estimation in a cure rate model (30 min)**
   Mini-symposium talk at International Conference on Advances in Interdisciplinary Statistics and Combinatorics (online)   *October, 2021*

3. **A new nonlinear sparse optimization framework for two-photon photoacoustic computed tomography (30 min)**
   Mini-symposium talk at SIAM Southeastern Atlantic Section Conference, Auburn University (online)   *September, 2021*

4. **A Nash games framework to control pedestrian behavior (30 min)**
   Mini-symposium talk at SIAM Conference on Optimization (online)   *July, 2021*

5. **A projected non-linear conjugate gradient algorithm for parameter estimation in a cure rate model (30 min)**
   Mini-symposium talk at Statistics' 21. Concordia University (online)   *July, 2021*

6. **A Data-driven stochastic framework for treatment assessment in colon cancer (30 min)**
   Mini-symposium talk at 13th conference of the Euro-American consortium AMiTaNS'21 (online) June, 2021

7. **A Fokker-Planck stochastic framework for treatment assessment in colon cancer (60 min)**
   Department of Mathematics Seminar, Texas A&M Corpus Christi (Online)   *April, 2021*

8. **Parameter estimation and uncertainty quantification in colon cancer-induced angiogenesis using a Fokker-Planck stochastic framework (60 min)**
   Applied Mathematics Seminar, University of Texas at Arlington (Online)   *April, 2021*

9. **An introduction to linear ordinary differential equations and some numerical methods (60 min)**
   Mathematics Department Seminar, Mediterranean Institute of Technology (Online) February, 2021

10. **A new nonlinear sparse optimization framework for ultrasound-modulated optical tomography (30 min)**
    Mini-symposium talk at DMV Annual Meeting (Online)   *September, 2020*

11. **Personalized prediction of treatment response for peritoneal carcinomatosis via a hybrid mechanistic/AI approach (10 min)**
    Group report presentation at NCI-NIH Innovation Lab (Online)   *August, 2020*

12. **Reconstruction of sparse log-conductivity in current density impedance imaging (15 min).**
    SIAM Conference on Imaging Sciences (IS20) (Online)   *July, 2020*

13. **A Pontryagin maximum principle based Fokker-Planck approach to control traffic motion. (30 min)**
    Mini-symposium talk at 12th conference of the Euro-American consortium AMiTaNS'20 (online) June 2020

14. **A Fokker-Planck approach to control crowd motion (30 min)**
    Mini-symposium talk at TX-LA SIAM Section Meeting, Southern Methodist University, USA November, 2019

15. **Developing data-driven models for obtaining personalized cancer treatments (15 min)**
National Institutes of Health, Informatics Technology for Cancer Research (NIH ITCR)
Teleconference, USA   *November, 2019*

16. **A Nash games framework to control pedestrian behavior (30 min)**
Mini-symposium talk at French-German-Swiss conference on Optimization, Nice, France September, 2019

17. **A new non-linear optimization framework for acousto-electric tomography (30 min)**
Mini-symposium talk at the conference Applied Inverse Problems, Grenoble, France   *July, 2019*

18. **A Fokker-Planck approach to control crowd motion (30 min)**
Collaborative Conference on Math-Finance and Statistics, Hawaii, USA   *March, 2019*

19. **Controlling pedestrian motion through a Nash games framework (50 min)**
Guest Speaker, Mathematical Association of America,
University of Texas at Arlington, USA   *March 2019*

20. **A fully non-linear optimization approach for acousto-electric tomography (50 min)**
Computational Science Seminar, University of Texas, Dallas, USA   *February, 2019*

21. **Math: A boon or a curse (50 min)**
Guest Speaker at a faculty program for student residents,
University of Texas at Arlington, USA   *November, 2018*

22. **Inverse problems and PDE-constrained optimization (50 min)**
SIAM Student Chapter, University of Texas at Arlington, USA   *October, 2018*

23. **Non-linear optimization methods for acousto-electric tomography (45 min)**
Departmental Seminar, TIFR-CAM, India   *May, 2018*

24. **An introduction to linear ordinary differential equations and some numerical methods (50 min)**
Mathematics Department Seminar, American University of Sharjah, UAE   *April, 2018*

25. **A Fokker-Planck Nash differential game to model crowd motion with avoidance (50 min)** *Mathematics Department Colloquium, American University of Sharjah, UAE*   *April, 2018*

26. **A Fokker-Planck Nash differential game to model crowd motion with avoidance (50 min)**
Mathematics Department Seminar, Denmark Technical University, Denmark   *August, 2017*

27. **A novel numerical method for a class of Liouville control problems (30 min)**
Workshop on Numerical Methods for Optimal Control and Inverse Problems,
Technical University of Munich, Germany   *April, 2017*

28. **Numerical inversion of a broken ray transform arising in single scattering optical tomography (30 min)**
Mini-symposium talk at the conference "100 Years of the Radon Transform", The Radon Institute of Computational and Applied Mathematics, Linz, Austria   *March, 2017*

29. **Numerical investigation of a class of Liouville control problems (50 min)**
Mathematics Department Seminar, University of Nice, France   *March, 2017*

30. **Inversion of a spherical Radon transform in a spherical shell (50 min)**
Mathematics Department Seminar, Denmark Technical University, Denmark   *October, 2016*

31. **Numerical inversion of a broken ray transform arising in single scattering optical tomography (50 min)**
    Mathematics Department Seminar, ICTS, Bangalore, India   *July, 2016*

32. **Inversion of a spherical Radon transform in a spherical shell (30 min)**
    Mini-symposium talk at the conference
    "Inverse Problems: Modeling and Simulation", Turkey   *May, 2016*

33. **A Fokker-Planck approach to control collective motion (45 min)**
    Mathematics Department Seminar, ICTS, Bangalore, India   *October, 2015*

34. **Inverse problems in imaging (50 min)**
    Inverse Problem Seminar Series, University of Texas at Arlington, USA   *March, 2015*

35. **A variational approach to flow estimation of unsteady incompressible flows (45 min)**
    Finite Element Meet, TIFR-CAM, Bangalore, India   *December, 2014*

36. **A discontinuous Galerkin vorticity-velocity formulation for incompressible 2D Euler flow (50 min)**
    Mathematics Department Seminar, Indian Institute of Science Education and Research, Pune, India   *June, 2014*

37. **Optimal control approach for estimation of incompressible fluid flows (30 min)**
    28th Annual Conference Of Ramanujam Mathematical Society,
    Ramaiah Institute of Technology, Bangalore, India   *June, 2013*

Faculty Development Activities Attended

1. **4th National Teacher's Congress**
   Maharashtra Institute of Technology World Peace University (online)   *December, 2020*

2. **National Science Foundation - Division of Mathematical Sciences (NSF-DMS) Virtual Office Hour**
   National Science Foundation (Online)   *November, 2020*

3. **Advancing Cancer Biology at the Frontiers of Machine Learning and Mechanistic Modeling Innovation Lab**
   National Cancer Institute-National Institutes of Health (Online)   *August, 2020*

4. **CoS CAREER Workshop**
   University of Texas at Arlington (Online)   *May, 2020*

5. **NSF workshop on CAREER Proposals**
   National Science Foundation (Online)   *April, 2020*

6. **National Institutes of Health, Informatics Technology for Cancer Research Teleconference**
   National Cancer Institute-National Institutes of Health   *November, 2019*

7. **Professional Development Seminar on Teaching**
   University of Texas at Arlington   *January, 2019*

8. **Strategic Planning Special Session**
   University of Texas at Arlington   *November, 2018*

Selected List of Workshops and Conferences Attended

1. **DMV Annual Meeting**
   Online *September, 2020*

2. **SIAM conference on imaging sciences**
   Online *July, 2020*

3. **12th conference of the Euro-American consortium AMiTaNS'20**
   Online *June, 2020*

4. **Applied Inverse Problems**
   University of Grenoble, France *July, 2019*

5. **Collaborative Conference on Math-Finance and Statistics**
   Hawaii, USA *March, 2019*

6. **Numerical Methods for Optimal Control and Inverse Problems**
   Technical University of Munich, Germany *April, 2017*

7. **100 Years of the Radon Transform**
   The Radon Institute of Computational and Applied Mathematics, Linz, Austria *March, 2017*

8. **8th International Conference on Inverse Problems: Modeling and Simulation**
   Turkey *May, 2016*

9. **Conference on Computational Partial Differential Equations, Finite Element Meet**
   TIFR-CAM, Bangalore, India *December, 2014*

10. **Gene Golub SIAM Summer School**
    The Radon Institute of Computational and Applied Mathematics, Linz, Austria *August, 2014*

11. **Advanced Instructional School on Theoretical and Numerical Aspects of Inverse Problems**
    TIFR-CAM, Bangalore, India *June, 2014*

12. **Workshop on Optimization with PDE Constraints**
    TIFR-CAM, Bangalore, India *November, 2013*

13. **Summer School on Numerics and Control of PDEs**
    Indian Institute of Science, Bangalore, India *July-August, 2013*

14. **Compact Course on Discontinuous Galerkin Methods by Chi-Wang Shu**
    TIFR-CAM, Bangalore, India *July, 2013*

15. **International Conference on Conservation Laws and Applications**
    TIFR-CAM, Bangalore, India *July, 2013*

16. **Theoretical and Computational Aspects of Nonlinear Waves**
    Indian Institute of Technology, Bombay, India *May, 2013*

17. **Advanced Workshop on Non-Standard Finite Element Methods**
    Indian Institute of Technology, Bombay, India *February, 2013*

18. **Instructional Workshop on Finite Element Methods**
TIFR-CAM, Bangalore, India *July, 2012*

19. **School on Cocompact Embeddings and Profile Decompositions**
TIFR-CAM, Bangalore, India *July, 2011*

20. **Workshop on Computational Science**
Supercomputer Education Research Centre , Bangalore, India *March, 2011*

21. **Mesh–Free Conference**
Indian Institute of Science, Bangalore, India *March, 2011*

22. **Monsoon School on Data Assimilation Research Programme**
TIFR-CAM, Bangalore, India *February, 2011*

23. **Workshop on Scientific Discovery through Intensive Data Exploration**
Jawaharlal Nehru Centre For Advanced Scientific Research, Bangalore, India *January, 2011*

24. **Conference on Recent Trends in Non-Linear Elliptic PDEs** *TIFR-CAM, Bangalore, India*
January, 2011

25. **Indian Institute of Science Mathematics Initiative (IMI) Workshop and Symposium on Mathematical Ecology**
Indian Institute of Science Education and Research, Kolkata, India *November, 2010*

26. **International Conference of Mathematicians-Satellite Conference on Partial Differential Equations**
TIFR-CAM, Bangalore, India *August, 2010*

27. **IMI Workshop and International Conference on Homogenization**
Indian Institute of Science, Bangalore, India *May, 2013*

28. **Symposium on "Perspectives in Mathematics"**
TIFR, Mumbai, India *November, 2009*

Students Supervised

Supervised postdoctoral fellows

1. **Rohit Kumar Mishra** UTA
Postdoctoral fellow *September, 2019 – October, 2020*

Supervised Ph.D. Students

1. **John Montalbo (co-supervised with Gaik Ambartsoumian)** UTA
Ph.D. Mathematics *September, 2018 – July, 2020*
   - Dissertation title: Inverse problems and forward propagation of optical flow.
   - Position after Ph.D.: *Data Analyst*, Tarrant County HIV Administrative Agency, USA.

2. **Madhu Gupta** UTA
Ph.D. Mathematics *September, 2019 – present*
   - Tentative dissertation title: Sparsity-based hybrid imaging and Fokker-Planck optimal control frameworks for detection and treatment of esophageal cancer.
   - Expected to graduate by August, 2023.

3. **Asma Ali Alghamdi** UTA
   Ph.D. Mathematics *July, 2020 – present*
   - Tentative dissertation title: Modeling of HIV dynamics and associated antiretroviral therapies using optimal control frameworks.
   - Expected to graduate by August, 2023.

4. **Mesfer Alajmi** UTA
   Ph.D. Mathematics *September, 2020 – present*
   - Tentative dissertation title: A game theoretic approach for modeling and assessing virotherapy-based treatments in hematologic cancers.
   - Expected to graduate by August, 2023.

5. **Hussein Said Ed Duweh** UTA
   Ph.D. Mathematics *September, 2020 – present*
   - Tentative dissertation title: Liouville optimal control frameworks for modeling dynamics and androgen deprivation therapies in prostate cancer.
   - Expected to graduate by August, 2023.

Supervised Master Students

1. **Jan Bartsch**
   (co-supervised with Alfio Borzì and Francesco Fanelli) University of Würzburg, Germany
   M.S. Mathematics *September, 2016 – September, 2017*
   - Dissertation title: Optimal control problems governed by Liouville models - Theoretical analysis and implementation.
   - Position after M.S.: *Ph.D. student*, University of Würzburg, Germany.

Supervised Undergraduate Students

1. **Achyuth Manoj**, University of Texas at Arlington, May, 2020 – current.

2. **Susanth Kakarla**, University of Texas at Arlington, June, 2020 – current.

3. **Juan Villegas**, University of Texas at Arlington, August, 2020 – current.

Dissertation/Thesis Committee

1. Osama Alkhazaleh, Ph.D. committee (chair Yue Liu, Mathematics, UTA.

2. John Montalbo, Ph.D. committee (co-chair; chair Gaik Ambartsoumian), Mathematics, UTA.

3. Zachry Angel, Ph.D. committee (member; chair Suvra Pal), Mathematics, UTA.

4. Mohammad Alharbi, Ph.D. committee (member; chair Christopher Kribs), Mathematics, UTA.

5. Pei Wang, Ph.D. committee (member; chair Suvra Pal), Mathematics, UTA.

6. Rawan Joudeh, M.S. committee (member; chair Gaik Ambartsoumian), Mathematics, UTA.

Teaching

Teaching at UTA

1. ***MATH 3330 (Fall 2021)*** *- Introduction to Linear Algebra and Vector Spaces (undergraduate)*, University of Texas at Arlington.
   Instructor, Class size - 60 students. Responsibilities: lectures, office hours, assignments, 3 exams per semester.

2. ***MATH 3330 (Spring 2021)*** *- Introduction to Linear Algebra and Vector Spaces (undergraduate)*, University of Texas at Arlington (Hybrid 3).
   Instructor, Class size - 28 students. Responsibilities: lectures, office hours, assignments, 3 exams per semester.

3. ***MATH 5321 (Fall 2020)*** *- Applied Partial Differential Equations (graduate)*, University of Texas at Arlington (Hybrid 3).
   Instructor, Class size - 18 students. Responsibilities: lectures, office hours, assignments, midterms and final exams.

4. ***MATH 5320 (Spring 2020)*** *- Ordinary Differential Equations (graduate)*, University of Texas at Arlington (Transition to online classes mid-semester).
   Instructor, Class size - 12 students. Responsibilities: lectures, office hours, assignments, midterms and final exams.

5. ***MATH 3319 (Fall 2019)*** *- Differential Equations and Linear Algebra (undergraduate)*, University of Texas at Arlington.
   Instructor, Class size - about 60 students. Responsibilities: lectures, office hours, 3 exams per semester.

6. ***MATH 2425 (Spring 2019)*** *- Calculus 2 (undergraduate)*, University of Texas at Arlington.
   Instructor, Class size - about 70 students. Responsibilities: lectures, office hours, 3 exams per semester.

7. ***MATH 1426 (Fall 2018)*** *- Calculus 1 (undergraduate)*, University of Texas at Arlington.
   Instructor, Class size - about 80 students. Responsibilities: lectures, office hours, 3 exams per semester.

Independent Study and Research Study Courses at UTA

1. ***MATH 5399 (Spring 2021)*** *- Research in Mathematics*, Research Study Course.

2. ***MATH 5999 (Spring 2021)*** *- Research in Mathematics*, Research Study Course.

3. ***MATH 5399 (Spring 2021)*** *- Research in Mathematics*, Research Study Course.

4. ***MATH 5699 (Spring 2021)*** *- Research in Mathematics*, Research Study Course.

5. ***MATH 5391 (Fall 2020)*** *- Introduction to Optimization*, Independent Study Course.

6. ***MATH 5391 (Fall 2020)*** *- Optimal Control of PDE*, Independent Study Course.

7. ***MATH 5699 (Fall 2020)*** *- Research in Mathematics*, Research Study Course.

Teaching before joining UTA

1. ***Mechanics (graduate) (Spring 2014)***, TIFR-CAM, Bangalore, India.
   Teaching assistant, Class size - about 18 students. Responsibilities: assignment and examination evaluations, supplementary lectures.

2. ***Computational Partial Differential Equations (graduate) (Fall 2013)***, TIFR-CAM, Bangalore, India.
   Teaching assistant, Class size - about 10 students. Responsibilities: assignment and examination evaluations, supplementary lectures.

Professional Memberships

1. Member of the *Mathematical Association of America*, 2018-present.

2. Member of the *Indian Society of Industrial and Applied Mathematics*, 2016-present.

Service

Professional Service

1. Chair of a session at the minisymposium titled *The Passage from Optimal Control to Differential Game Problems* at the conference *SIAM Conference on Optimization*, 2021.

2. Co-organizer of a minisymposium titled *The Passage from Optimal Control to Differential Game Problems* at the conference *SIAM Conference on Optimization*, 2021.

3. Co-chair of a session at the minisymposium *Generalized Radon Transforms and Applications* at the conference *Inverse Problems Modeling and Simulation*, Turkey, 2016.

4. Journal reviewer for

   - Inverse Problems
   - Journal of Mathematical Imaging and Vision
   - Inverse Problems in Science and Engineering
   - Applied Mathematics
   - Applied Mathematical Modeling
   - SIAM Reviews.
   - IEEE Signal Processing Letters.

   - Automatica
   - International Journal of Computer Mathematics
   - IMA Journal of Applied Mathematics
   - Journal of Ramanujan Mathematical Society
   - Exploration of Targeted Anti-tumor Therapy
   - Journal of Dynamical and Control Systems

5. Reviewer for

   - AMS Mathematical Reviews
   - Zentralblatt MATH (zbMATH)

University Service

1. Member of the College of Science Standing Committee for Diversity, Equity and Inclusion: Undergraduate Subcommittee, UTA, December, 2020 – present.

2. Member of the Preliminary A - Mathematical Analysis Subcommittee, Department of Mathematics, UTA, December, 2020 – present.

3. Member of the Preliminary B - Pure and Applied Analysis Subcommittee, Department of Mathematics, UTA, July, 2020 – December 2020.

4. Member of the Faculty Hiring Committee, Department of Mathematics, UTA, May, 2019 – April, 2021.

5. Member of the Public Relation and Awards Committee, Department of Mathematics, UTA, May, 2019 – present.

6. Co-organizer of the Calculus Bowl, Department of Mathematics, UTA, January, 2019 – present.

7. Proctor, Preliminary A - Mathematical Analysis exam, Department of Mathematics, UTA, August, 2019.

8. Organizer of the Inverse Problems Seminar Series, UTA, January, 2015 – May, 2015.

Articles in the Media (hyperlinks)

1. February 2018 - Science Trends: Solving mass transportation problems using Liouville equations

2. September 2017- Eureka Alert: On a collision course with game theory

3. September 2017 - PhysOrg: On a collision course with game theory

4. September 2017 - Science Daily: On a collision course with game theory

5. September 2017 - N+1: Pedestrian traffic described using game theory

6. September 2017- Jura Forum: On a collision course with game theory

Collaborators

- Dr. Alfio Borzì, Department of Mathematics, University of Würzburg, Germany.

- Dr. Kim Knudsen, Department of Applied Mathematics and Computer Science, Denmark Technical University, Denmark.

- Dr. Mario Annunziato, Department of Mathematics, University of Salerno, Italy.

- Dr. Abderrahmane Habbal, Department of Mathematics, University of Nice, France.

- Dr. Didier Auroux, Department of Mathematics, University of Nice, France.

- Dr. Rim Gouia-Zarrad, Department of Mathematics, American University of Sharjah, UAE.

- Dr. Sunghwan Moon, Department of Mathematics, Kyungpook National University, South Korea.

- Dr. Gaik Ambartsoumian, Department of Mathematics, University of Texas at Arlington, USA.

- Dr. Hristo Kojouharov, Department of Mathematics, University of Texas at Arlington, USA.

- Dr. Benito Chen, Department of Mathematics, University of Texas at Arlington, USA.

- Dr. Suvra Pal, Department of Mathematics, University of Texas at Arlington, USA.

- Dr. Zui Pan, College of Nursing and Health Innovation, University of Texas at Arlington, USA.

- Dr. Carlos Chan, Department of Surgery, University of Iowa, USA.

Additional Information

Programming Skills
- C++, PYTHON, MATLAB

- FENICS, COMSOL, DEAL.II

- PARAVIEW, VISIT

- GITHUB