

Niladri Das

POSITION Ph.D. candidate in Aerospace Engineering at Texas A&M University working since September 1, 2015, employed as a Graduate Assistant Research/Teaching.

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CURRENT
RESEARCH

- **Non-Linear filtering**
- **Situational Awareness**

EDUCATION Doctor of Philosophy in **Aerospace Engineering** Adviser: [Dr. R. Bhattacharya](#)
Texas A&M University, USA 2015 - 2020
Dissertation: Optimal Transport Based Filtering GPA: 3.826/4
and Sensing for Non-Linear Stochastic Systems.

Master of Technology in **Electrical Engineering** Adviser: [Dr. L. Behera](#)
Indian Institute of Technology Kanpur, India 2012 - 2014
Dissertation: Learning to Grasp & Programming by GPA : 7.91/10
Demonstration Using a 7-DOF [Barrett WAM](#).

Bachelor of Engineering in **Electrical Engineering** Adviser: Dr. A. Chatterjee
Jadavpur University, Kolkata, India 2008 - 2012
Project: Image Processing Based Object Detection. GPA : 7.84/10

WORK EX-
PERIENCES **Graduate Teaching Fellow** 26 Aug - 15 Jan, 2020.
Teaching *Advanced Control for Aerospace Vehicles* to senior
Aerospace undergrads (72 students).

- Linear Systems, PID control, Root Locus, Freq. Domain design
- Teaching Matlab to design linear controller

Graduate Research I Adviser: Dr. R. Bhattacharya
Dept. of Aerospace Engineering, Texas A&M. Sep 2015-Present

- Working on an [AFRL](#) project project, *Adaptive Markov Inference Game Optimization for Rapid Discovery of Evasive Satellite Behaviors*, in collaboration with Intelligent Fusion Technology, Inc (2018-Present)
- Worked on an AFOSR project, *Cloud Computing Based Robust Space Situational Awareness*, in collaboration with Dept. of Statistics, TAMU (2015-2018)
 - Developed Optimal Transport filter based framework for SSA.

Project Associate PI: Dr. L. Behera
Dept. of Electrical Engineering, IIT Kanpur Aug 2014 - Jun 2015

- Developed Gaussian Mixture based model to compensate the unknown non-linearities of 7 degree of freedom [Barrett WAM](#).
- Collaborated in implementing a Inverse Dynamic Model and Higher Order Sliding Mode Control for 7 degree of freedom Barrett WAM. [\[C++ codes\]](#)[\[video\]](#)

- Developed dynamical system based trajectory learning for Barrett WAM.
- Served as a Thesis mentor for a master's student.
- Taught ROS to two Master's student.

Graduate Research II

Dept. of Electrical Engineering, IIT Kanpur

Adviser: Dr. L. Behera

July 2013-July 2014

- Developed Inverse Kinematic model for Barrett WAM.
- Implemented Kinect based Object segmentation for grasping using **Deep Learning**.
- Developed a hand-eye autonomous calibration technique for Barrett WAM.
- Implemented Symbolic Encoding based skill learning on Barrett WAM.[\[video1\]](#)[\[video2\]](#)
- Mentored two Under-Graduate interns.

ALL PUBLICATIONS

Journals

1. *Privacy-Utility Aware Kalman Filtering for LTI Systems* [First Author, Preparing, 2020]
2. *Privacy and Utility Aware Data Sharing for Space Situational Awareness from Ensemble and Unscented Kalman Filtering Perspective* **IEEE Transactions on Aerospace and Electronic Systems** [First Author, Submitted, 2019][\[arXiv\]](#)
3. *Optimal Transport Based Tracking of Space Objects in Cylindrical Manifolds*. **Journal of Astronautical Sciences** (Springer) [First Author,, Accepted, 2019][\[preprint\]](#)
4. *Optimal Transport based Tracking of Space Objects using Range Data from a Single Ranging Station*. **Journal of Guidance, Control, and Dynamics** [First Author, Accepted, 2019][\[preprint\]](#)

Conferences

1. *Optimal Sensing Precision for Multi-Rate Kalman Filters with Guaranteed Error Bounds* IFAC World Congress 2020 [First Author, Submitted].
2. *Optimal Transport Based Filtering with Nonlinear State Equality Constraints* IFAC World Congress 2020 [First Author, Submitted].
3. *Optimal Sensing Precision in Ensemble and Unscented Kalman Filtering* IFAC World Congress 2020 [First Author, Submitted].
4. *Combining Visible and Infrared Spectrum Imagery using Machine Learning for Small Unmanned Aerial System Detection* SPIE Automatic Target Recognition 2020 [Third Author, Accepted].
5. *Sparse Sensing Architecture For Kalman Filtering With Guaranteed Error Bound*. 2017 1st IAA Conference on Space Situational Awareness, Orlando, Florida [First Author].
6. *Control of a 4 DoF Barrett WAM Robot - Modeling, Control Synthesis and Experimental Validation*. 2016 IEEE First International Conference on Control, Measurement and Instrumentation [Second Author].
7. *Learning Object Manipulation from Demonstration through Vision for the 7-DOF Barrett WAM*. 2016 IEEE First International Conference on Control, Measurement and Instrumentation [First Author].

8. *A probabilistic framework of learning movement primitives from unstructured demonstrations.*
2015 IEEE 13th International Conference on Industrial Informatics [First Author].
9. *Robot Learns from Human Teacher Through Modified Kinesthetic Teaching.*
2014 International conference on Advances in Control and Optimization of Dynamic Systems [Second Author].

SKILLS *Programming Languages and Packages:* C | C++ | Python | Julia | Matlab | Robot Operating System.

ALL AFFILI- *Aerospace Graduate Student Council of Texas A&M University*
ATIONS

- Student Council Mentor of Aerospace Engineering Department at Texas A&M University. (Academic Year 2018)
- Student Council Member of Aerospace Engineering Department at Texas A&M University. (Academic Year 2017)
- GPSC: Graduate and Professional Student Council delegate of Aerospace Department. (Academic Year 2017)

Other Organisations:

- American Institute of Aeronautics and Astronautics
- Institute of Electrical and Electronics Engineers
- Society for Industrial and Applied Mathematics
- American Astronautical Society.

Journal Reviewer: IEEE Systems Journal.

Conference Reviewer: IFAC World Congress