Niladri Das

Contact Information

Aerobotics Lab, #201, Reed-McDonald Bldg,
Dept. of Aerospace Engineering, Texas A&M,
575 Ross St, College Station, TX 77843

E-Mail : niladridas@tamu.edu
GitHub : github.com/niladridas

Current Position

Ph.D. candidate working on development and application of methodologies in the broad area of uncertainty quantification and filtering.

Education

Doctor of Philosophy in Aerospace Engineering — Adviser: Dr. R. Bhattacharya
Texas A&M University, USA — 2015 - Present
Dissertation: Developing new Space Situational Awareness algorithms for improved real-time tracking of space objects. — GPA: 3.826/4

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

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

Experiences

Graduate Assistant Researcher — Adviser: Dr. R. Bhattacharya
Dept. of Aerospace Engineering, Texas A&M. — Sep 2015-Present
Working on an Air Force Project about Space Situational Awareness. It involves collaborating with Dept. of Statistics of TAMU, developing and implementing particle based non-linear filters.

Project Associate — Adviser: Dr. L. Behera
Dept. of Electrical Engineering, IIT Kanpur — Jan 2015 - Jun 2015
Worked on a project to implement Non-linear control technique (Higher Order Sliding Mode Control) on 7 degree of freedom Barrett WAM. Developed physics based Inverse Dynamic Model. Developed Gaussian Mixture based model to compensate the unknown non-linearities. This work led to a conference publication.

Project Associate — Adviser: Dr. L. Behera
Dept. of Electrical Engineering, IIT Kanpur — Aug 2014 - Jan 2015
Worked on a project to develop dynamical system based trajectory learning for a 7 DoF robot arm. Implemented Gaussian Mixture based model to learn trajectories from Kinesthetic teaching. Developed a method to relax the restriction of unique attractor point during training. This work lead to a conference publication.

Graduate Research Experience — Adviser: Dr. L. Behera
Dept. of Electrical Engineering, IIT Kanpur — July 2013-July 2014
Worked on the Masters Thesis. This work involved solving inverse kinematic problem for a 7 DoF Redundant Manipulator, implementing Kinect based Object segmentation for grasping using Deep Learning, developing a hand-eye autonomous calibration technique and eventually implementing Symbolic Encoding based skill learning.
This thesis led to a conference publication.

Graduate Teaching Assistant — Supervisor: Dr L. Behera
Dept. of Electrical Engineering, IIT Kanpur — Jan 2014 - May 2014
Course: Basics of Modern Control System. — Aug 2013 - Nov 2013
Checking assignments and teaching Matlab to solve control systems related problems

Graduate Teaching Assistant — Supervisor: Dr. R. Potluri
Dept. of Electrical Engineering, IIT Kanpur — Jan 2013 - Apr 2013
Course: Basics of Modern Control System.
Checking assignments and teaching Octave to solve control systems related problems

Student Mentoring
Dept. of Electrical Engineering, IIT Kanpur
Intelligent Systems Laboratory

- As a Project Assistant supervised a Masters student for his thesis
- As a Project Assistant taught two Masters student how to use Robot Operating System
- As a Master student mentored two Under-Graduate intern. They worked on implementing Deep Learning, learned how to use Point Cloud Library and Barrett WAM programming.

Publications

Conference

- "Sparse Sensing Architecture For Kalman Filtering With Guaranteed Error Bound." 2017 1st IAA Conference on Space Situational Awareness, Orlando, Florida.
- "Control of a 4 DoF Barrett WAM Robot - Modeling, Control Synthesis and Experimental Validation." 2016 IEEE First International Conference on Control, Measurement and Instrumentation
- "Learning Object Manipulation from Demonstration through Vision for the 7-DOF Barrett WAM." 2016 IEEE First International Conference on Control, Measurement and Instrumentation
- "A probabilistic framework of learning movement primitives from unstructured demonstrations." 2015 IEEE 13th International Conference on Industrial Informatics
- "Robot Learns from Human Teacher Through Modified Kinesthetic Teaching." 2014 International conference on Advances in Control and Optimization of Dynamic Systems

Journal

- "Optimal Transport Based Tracking of Space Objects in Cylindrical Manifolds". Journal of Astronautical Sciences (Springer) [**under review**]

Achievements

- Ranked **218**th(top **0.1**%) in India in **Graduate Aptitude Test in Engineering-2012**, the national level entrance test for post-graduate studies at the Indian Institute of Technology & Indian Institute of Science.
- Ranked **162**nd (top **0.1**%) in state in **WBJEE-2008**, a state level entrance test for under-graduate studies.
- Recipient of Scholarship under *Scheme of Scholarship for College and University Students of Govt. of India* for State Board Examination performance (**120**th in Merit List).

Skills

Programming Languages
C , C++ , Python, Julia
Softwares Packages
Matlab, LaTeX, Robot Operating System, OpenCV, PCL, Eigen, Boost, OMPL.

Organisations

- AIAA: *The American Institute of Aeronautics and Astronautics*
  Student Member
- IEEE: *Institute of Electrical and Electronics Engineers*
  Student Member of:
  - IEEE Control System Society
  - IEEE Aerospace and Electronic Systems Society
  - IEEE Young Professionals

- SIAM: *Society for Industrial and Applied Mathematics*
  Graduate Student Member of:
  - SIAG on Control & Systems Theory Member
  - SIAG on Uncertainty Quantification Member
- AGSC: *Aerospace Graduate Student Council*
  - Student Council Member of Aerospace Engineering Department at Texas A&M University
  - GPSC: Graduate and Professional Student Council delegate of Aerospace Department.

Referees

- Raktim Bhattacharya (Ph.D. Advisor)
  Associate Professor, Departement of Aerospace Engineering
  Texas A&M University
  Office: HRBB 727C
  Phone: 979.862.2914
  Email: raktim@tamu.edu
- Laxmidhar Behera (Masters Advisor)
  Professor, Departement of Electrical Engineering
  Indian Institute of Technology Kanpur
  Phone: +91.0512.259.7198
  Email : lbehera@iitk.ac.in
- Amitava Chatterjee (Bachelors Advisor)
  Professor, Departement of Electrical Engineering
  Jadavpur Univsersity
  Phone: +91 33 2414 6949 (O), +919433960972 (Mobile)
  Email: achatterjee@ee.jdvu.ac.in; cha_ami@yahoo.co.in
- Naren Naik
  Associate Professor, Department of Electrical Engineering
  Indian Institute of Technology Kanpur, India
  Office: 303A ACES, Dept. of Elec. Eng.
  Phone: +91 512 259 6518
  Email: nnaik@iitk.ac.in
- Swagata Munshi (Jadavpur University)
  Professor, Department of Electrical Engineering
  Jadavpur University, Kolkata, India
  Phone: +91 033 2414 6949 (O)
  Email: smunshi@ee.jdvu.ac.in, sugatamunshi@yahoo.com