Curriculum Vitae   Akshay Shetty

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496 Lomita Mall, Stanford, CA 94305   [LinkedIn]

Education

Ph.D. Aerospace Engineering [thesis]   Champaign, Illinois
University of Illinois at Urbana-Champaign   **2017–2021**

M.S. Aerospace Engineering [thesis]   Champaign, Illinois
University of Illinois at Urbana-Champaign   **2014–2017**

B.Tech. Aerospace Engineering   Mumbai, India
Indian Institute of Technology Bombay   **2010–2014**

Research and Work Experience

Postdoctoral Researcher   Stanford, California
NAV Lab [webpage], Stanford University   **2021–present**
Advisor: Prof. Grace Gao

- Worked on and supervised multiple projects related to safe navigation and robust state estimation for autonomous systems

Research Intern   Mountain View, California
NASA Ames Research Center   **Summer 2016 & Summer 2017**

- Mentored summer interns and developed software for autonomous vision-based UAV navigation [video][code]

Visiting Research Scholar   Shrivenham, UK
Cranfield University, Ministry of Defence   **Summer 2013**

- Improved vehicle dynamics in Virtual Battle Space by interfacing with IPG Carmaker software

Research Intern   Bangalore, India
Indian Space Research Organization (ISRO)   **Summer 2012**

- Evaluated receiver localization algorithms for the Indian Regional Navigation Satellite System

Journal Papers

1. **Akshay Shetty**, Timmy Hussain and Grace Gao, "Decentralized Connectivity Maintenance for Multi-robot Systems Under Motion and Sensing Uncertainties," *NAVIGATION: Journal of the Institute of Navigation*, Accepted. [pdf]

2. Ashwin V. Kanhere*, Shubh Gupta*, **Akshay Shetty**, and Grace Gao, "Improving GNSS Positioning using Iterative Deep Corrections," *NAVIGATION: Journal of the Institute of Navigation*, Accepted. [pdf]

3. **Akshay Shetty** and Grace Gao, "Predicting State Uncertainty Bounds Using Non-linear Stochastic Reachability Analysis for Urban GNSS-based UAS Navigation," *IEEE Intelligent Transportation Systems*, DOI: 10.1109/TITS.2020.3040517, November 2020. [pdf]

4. **Akshay Shetty** and Grace Gao, "Adaptive Covariance Estimation of LiDAR-based Positioning Errors for UAVs," *NAVIGATION: Journal of the Institute of Navigation*, DOI: 10.1002/navi.307, May 2019. [pdf]

Magazine Articles

Akshay Shetty and Grace Gao, "GPS-LiDAR Fusion with 3D City Models," *GPS World Magazine*, Cover Story, September 2017. [pdf]

Conference Papers

1. **Akshay Shetty**, Adam Dai, Alexandros Tzikas and Grace Gao, "Safeguarding Learning-Based Planners Under Motion and Sensing Uncertainties Using Reachability Analysis," *Conference on Robot Learning (CoRL) 2022*, Submitted. [pdf]

2. Shubh Gupta*, Ashwin V. Kanhere*, **Akshay Shetty**, and Grace Gao, "Designing Deep Neural Networks for Sequential GNSS Positioning," *35th International Technical Meeting of the Satellite Division of The Institute of Navigation (ION GNSS+ 2022)*, Accepted.

3. Tara Mina, Ashwin V. Kanhere, **Akshay Shetty**, and Grace Gao, "GPS Spoofing-Resilient Filtering with Chimera and Self-Contained Odometry," *35th International Technical Meeting of the Satellite Division of The Institute of Navigation (ION GNSS+ 2022)*, Accepted.

4. Ashwin V. Kanhere, Tara Mina, **Akshay Shetty**, and Grace Gao, "Factor Graph-based Spoofing Mitigation using the Chimera Signal Enhancement," *35th International Technical Meeting of the Satellite Division of The Institute of Navigation (ION GNSS+ 2022)*, Accepted.

5. **Akshay Shetty**, Timmy Hussain and Grace Gao, "Decentralized Connectivity Maintenance for Multi-robot Systems Under Motion and Sensing Uncertainties," *Proceedings of the 34th International Technical Meeting of the Satellite Division of The Institute of Navigation (ION GNSS+ 2021)*, St. Louis MO, Sep. 2021. **Best Presentation of the Session Award**. [pdf][slides][video]

6. Ashwin V. Kanhere*, Shubh Gupta*, **Akshay Shetty**, and Grace Gao, "Improving GNSS Positioning using Iterative Deep Corrections," *Proceedings of the 34th International Technical Meeting of the Satellite Division of The Institute of Navigation (ION GNSS+ 2021)*, St. Louis MO, Sep. 2021. [pdf][slides][video][code]

7. **Akshay Shetty** and Grace Gao, "Trajectory Planning Under Stochastic and Bounded Sensing Uncertainties Using Stochastic Reachability," *Proceedings of the 33rd International Technical Meeting of the Satellite Division of The Institute of Navigation (ION GNSS+ 2020)*, St. Louis MO, Sep. 2020. [pdf][slides][video]

8. **Akshay Shetty** and Grace Gao, "Predicting State Uncertainty for GNSS-based UAV Path Planning Using Stochastic Reachability," *Proceedings of the 32nd International Technical Meeting of the Satellite Division of The Institute of Navigation (ION GNSS+ 2019)*, Miami FL, Sep. 2019. [pdf][slides]

9. **Akshay Shetty** and Grace Gao, "UAV Pose Estimation using Cross-view Geolocalization with Satellite Imagery," *International Conference on Robotics and Automation (ICRA)*, Montreal, Canada, May 2019. [pdf][video][data]

10. **Akshay Shetty** and Grace Gao, "Covariance Estimation for GPS-LiDAR Sensor Fusion for UAVs," *Proceedings of the 30th International Technical Meeting of the Satellite Division of The Institute of Navigation (ION GNSS+ 2017)*, Portland OR, Sep. 2017. [pdf]

11. **Akshay Shetty** and Grace Gao, "Vision-Aided Measurement Level Integration of Multiple GPS Receivers for UAVs," *Proceedings of the 28th International Technical Meeting of the Satellite Division of The Institute of Navigation (ION GNSS+ 2015)*, Tampa FL, Sep. 2015. [pdf]

12. **Akshay Shetty** and Grace Gao, "Measurement Level Integration of Multiple Low-Cost GPS Receivers for UAVs," *Proceedings of the 2015 International Technical Meeting of the Institute of Navigation (ION ITM 2015)*, Dana Point, CA, Jan. 2015. [pdf]

Skills

Programming	Python, C++, MATLAB, C#
Learning and Robotics	PyTorch, ROS, AirSim, Unity, Gazebo, Pixhawk

Academic Community Service

    Session Chair, *ION ITM Conference* [website]   **Jan 2022**
    Session: Navigation of Unmanned Aerial Vehicles and other Autonomous Systems

    Student Moderator, *3rd NorCal Controls Workshop* [website]   **Jan 2021**
    Virtual

    Paper Reviewer
    IEEE Transactions on Robotics (T-RO), International Conference on Robotics and Automation (ICRA), NAVIGATION: Journal of The Institute of Navigation, IEEE Transactions on Aerospace and Electronic Systems (T-AES), AIAA Journal of Guidance, Control, and Dynamics (JGCD).

Honors and Awards

    2021   Best Presentation of the Session Award [video], *ION GNSS+ Conference 2021*
    2019   Video of the Month [video], *Coordinated Science Lab, University of Illinois*
    2016   Google Special Mention, *HackIllinois*
    2015   Most Creative Team, *Smart Bar Hackathon*
    2014   Institute Silver Medal, *Indian Institute of Technology Bombay*