

ARJUN H. RAO

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EDUCATION

- 2016 Ph.D., Aeronautics & Astronautics Engineering
Purdue University, West Lafayette, Indiana, United States
Specialization in Aerospace Systems Engineering
Advisor: Prof. Karen Marais
Committee: Prof. William Crossley, Prof. Steven Landry, & Prof. Mary Johnson
- 2012 M.S., Aerospace Engineering
University of Illinois at Urbana-Champaign, Illinois, United States
Specialization in Aerospace Systems & Aerodynamics
Advisor: Prof. Michael S. Selig
- 2009 B.Eng., Mechanical Engineering
R.V. College of Engineering, Bangalore, India
Advisor: Prof. C. S. Murthy

PROFESSIONAL APPOINTMENTS

- 2018-present Assistant Research Engineer
Texas A&M University, College Station, Texas, United States
Department of Industrial & Systems Engineering
- 2016-2018 Research Specialist
The Ohio State University, Columbus, Ohio, United States
Center for Aviation Studies, College of Engineering
- 2010-2012 Section Instructor
University of Illinois at Urbana-Champaign, Illinois, United States
Department of Computer Science

PUBLICATIONS (¹ Mentored Graduate Student)

Refereed publications

Book Chapters:

- 1) **Rao, A.H.**, Sasangohar, F. (expected 2020). Design for Veterans. In R. Valdez & R. Holden (Eds.) *The Patient Factor: A Handbook on Patient Ergonomics*. CRC Press.
- 2) **Rao, A.H.**, Mehta, R. K., Sasangohar, F. (2019 – in press). Physiological and Psychological Aspects. In E. Ladanza (Ed.) *Clinical Engineering Handbook, 2nd Edition*. Academic Press.

Journal Articles Published:

- 1) **Rao, A.H.** and Marais, K. (2019). A State-based Approach for Modeling General Aviation Accidents, *Reliability Engineering and System Safety*, Vol. 193.
- 2) Son, C.¹, Sasangohar, F., **Rao, A. H.**, Larsen, E., Neville, T. (2019). Resilient Performance of Emergency Department: Patterns, Models and Strategies, *Safety Science*, 120, 362-373.
- 3) McDonald, T., Sasangohar, F., Jatav, A.K.¹, **Rao, A.H.** (2019). Continuous Monitoring and Detection of Post-Traumatic Stress Disorder (PTSD) Triggers Among Veterans: A Supervised Machine Learning Approach. *IISE Transactions on Healthcare Systems Engineering*, 1-15.
- 4) **Rao, A.H.** and Marais, K., High-Risk Occurrence Chains in Helicopter Accidents (2018), *Reliability Engineering and System Safety*, Vol. 170, pp. 85-98.

Journal Articles Submitted or Under Review:

- 1) Sasangohar, F., **Rao, A. H.**, Sadeghi, S.¹, Susindar, S., Scott, S.D., Investigating the Location of an Interruption Recovery Tool for Supervisory-Level Command and Control Missions, *IEEE Transactions in Human-Machine Interaction*. (Under Review)
- 2) Sasangohar, F., Danesh, V., Sadeghi, M., **Rao, A.H.**, Interruptions in Critical Care Nursing: Gaps and Opportunities in Research, *BMJ Quality & Safety* (Under Review)
- 3) Larsen, E. L., **Rao, A. H.**, Sasangohar, F., A systematic review of the growing cyber-attack downtime threat, *Journal of the American Medical Informatics Association*. (Submitted)

Journal Articles in Preparation:

- 1) **Rao, A.H.**, Yu, M.¹, Sasangohar, F., Universal Safety Database: Towards Harmonizing Safety Databases, *Reliability Engineering and System Safety*.
- 2) **Rao, A. H.**, Sasangohar, F., Shetty, S., Avnet, M., Visualizing Accident Causation Networks: A Case Study of Complex Nuclear Accidents, *Safety Science*.
- 3) **Rao, A. H.**, Markert, C., Sasangohar, F., Cummings, M., Understanding Sources of Complexity in Nuclear Accidents, *Journal of Safety Research*.
- 4) Bonet, S.¹, **Rao, A.H.**, Sasangohar, F., Integration of RPMs into Physicians Work in Underserved Communities: A Healthcare Provider Perspective, *Journal of Telemedicine & Telecare*.
- 5) Rodriguez-Paras, C.¹, **Rao, A. H.**, Sasangohar, F., Investigating Architectural and Space Design Considerations for Post-Traumatic Stress Disorder (PTSD) Patients, *Applied Ergonomics*.
- 6) Zahed, K.¹, **Rao, A. H.**, Sasangohar, F., Behavioral Change in mHealth: A Scoping Review of Literature, *Journal of Medical Internet Research*.
- 7) Markert, C.¹, **Rao, A. H.**, Sasangohar, F., Effectiveness of Telehealth Incorporating Health Coaching for the Elderly: Scoping Literature Review, *Journal of Medical Internet Research*.
- 8) Moon, J.¹, Rodriguez-Paras, C.¹, **Rao, A. H.**, Sasangohar, F., Developing a PTSD Care Model, *Journal of Traumatic Stress*.

Conference Proceedings:

- 1) **Rao, A. H.**, Yu, M.¹, & Sasangohar, F. (2019). Towards Harmonizing Safety Databases: An Assessment of Existing Data Sources. In Proceedings of the Human Factors and Ergonomics Society 63rd Annual

Meeting, Seattle, WA, October 28–November 1.

- 2) Flores, J., Larsen, E., **Rao, A.H.**, & Sasangohar, F. (2019). Towards a Definition of Liminal Fatigue in Nursing. In Proceedings of the Human Factors and Ergonomics Society 63rd Annual Meeting, Seattle, WA, October 28–November 1.
- 3) Markert, C. ¹, **Rao, A. H.**, & Sasangohar, F. (2019). Effectiveness of Telehealth Incorporating Health Coaching for the Elderly: A Scoping Literature Review. In Proceedings of the Human Factors and Ergonomics Society 63rd Annual Meeting, Seattle, WA, October 28–November 1.
- 4) Coté, V. ¹, **Rao, A. H.**, & Sasangohar, F. (2019). Usability Study of the iProven BPM-337BT Blood Pressure Monitor and App. In Proceedings of the Human Factors and Ergonomics Society 63rd Annual Meeting, Seattle, WA, October 28–November 1.
- 5) **Rao, A.H.** and Puranik, T.G. (2018). Retrospective Analysis of Approach Stability in General Aviation Operations. 18th AIAA Aviation Technology, Integration, and Operations Conference, AIAA Paper 2018-3049, Atlanta, GA, June 2018.
- 6) Subramanian, S.V. and **Rao, A.H.** (2018). Deep-learning based Time Series Forecasting of Go-around Incidents in the National Airspace System. AIAA SciTech 2018, AIAA Paper 2018-0424, Kissimmee, FL, January 2018.
- 7) **Rao, A.H.**, Pruchnicki, S., and Young, S. B. (2017). A Survey to Understand the Use of In-flight Weather Information Products and Services. 17th AIAA Aviation Technology, Integration, and Operations Conference, AIAA Paper 2017-3780, Denver, CO, June 2017.
- 8) Pruchnicki, S. and **Rao, A.H.** (2017). Exploring Facilitated Debriefing Techniques Using a Diary Study. 19th International Symposium on Aviation Psychology, Dayton, OH, April 2017.
- 9) **Rao, A.H.** and Marais, K. (2016). Comparing Hazardous States and Trigger Events in Fatal and Non-Fatal Helicopter Accidents. 16th AIAA Aviation Technology, Integration, and Operations Conference, AIAA Paper 2016-3916, Washington, DC, June 2016.
- 10) Gavrilovski, A, Jimenez, H., Mavris, D, **Rao, A.H.**, Marais, K., Shin, S., and Hwang, I. (2016). Challenges and Opportunities in Flight Data Mining: A Review of the State of the Art. AIAA SciTech, 2016, AIAA Paper 2016-2135, San Diego, CA, January 2016.
- 11) **Rao, A.H.**, Fala, N., and Marais, K. (2016). Analyzing Maintenance Risk from Helicopter Accident Data. AIAA SciTech, 2016, AIAA Paper 2016-0923, San Diego, CA, January 2016.
- 12) **Rao, A.H.**, Marais, K. (2015) Identifying High-Risk Occurrence Chains in Helicopter Operations from Accident Data. 15th AIAA Aviation Technology, Integration, and Operations Conference, 2015, AIAA Paper 2015-2848, Dallas, TX, June 2015.
- 13) **Rao, A.H.**, Uhlig, D.V., Selig, M.S. (2012). Glide and Powered Flight Characteristics of Micro Air Vehicles from Experimental Measurements. AIAA Applied Aerodynamics Conference, 2012, AIAA Paper 2012-2768, New Orleans, LA, June 2012.
- 14) Uhlig, D.V., Sareen, A., Sukumar, P., **Rao, A.H.**, Selig, M.S. (2010) Determining Aerodynamic Characteristics of Micro Air Vehicles Using Motion Tracking. AIAA Guidance, Navigation and Control Conference, 2010, AIAA Paper 2010-8416, Toronto, Canada, 2010.

Posters:

- 1) Zahed, K. ¹, **Rao, A. H.**, & Sasangohar, F. (2019). Behavior Change and Persuasion in Mobile Health Interventions: A Critical Literature Review. Poster to be presented at the Human Factors and Ergonomics Society Annual Meeting, Seattle, WA, October 28–November 1.
- 2) **Rao, A.H.**, Larsen, E., Rodriguez-Paras, C., & Sasangohar, F. (2019). Designing for Veterans: A User-

Centered Approach to Designing Continuous Monitoring Tools for Post-Traumatic Stress Disorder. Poster presented at the Human Factors and Ergonomics Society Health Care Symposium, Chicago, IL, March 2019.

- 3) Dittoe, S., **Rao, A.H.**, and Young, S. B. (2017). Safety Analysis of General Aviation Runway Operations. University Aviation Association Virtual Poster Session, October 2017. **3rd Place in Graduate Category**, https://www.aaa.aero/poster_contest_2017_winners.php
- 4) Pruchnicki, S, **Rao, A.H.**, & Young, S. B. (2017). Resilient Capabilities in Single Pilot and Crewed Flight Operations. Poster presented at the 7th Resilience Engineering Association Symposium, Liege, Belgium, June 2017.
- 5) **Rao, A.H.**, Pruchnicki, S., & Young, S. B. (2017). Problem Solving/Decision Making and Procedures for Unexpected Events. Poster presented at the PEGASAS Annual Meeting, College Station, TX, June 2017.
- 6) **Rao, A.H.**, Pruchnicki, S., & Young, S. B. (2017). Problem Solving/Decision Making and Procedures for Unexpected Events. Poster presented at the International Society on Aviation Psychology, Dayton, OH, April 2017.
- 7) **Rao, A. H.** & Marais, K. (2015). Identifying High-Risk Occurrence Chains in Helicopter Operations from Accident Data. Poster presented at the PEGASAS Annual Meeting, West Lafayette, IN, June 2015.

Non-refereed publications

Theses:

- 1) **Rao, A.H.** (2016) A New Approach to Modeling Aviation Accidents. Ph.D. Dissertation, Aeronautics & Astronautics Engineering, Purdue University, West Lafayette, Indiana, United States.
- 2) **Rao, A.H.** (2012) Measurement of Aerodynamic Characteristics of Micro Air Vehicles Using Motion Tracking. M.S. Thesis, Aerospace Engineering, Purdue University, West Lafayette, Indiana, United States.

Technical Reports:

- 1) Herndon, A. A., Jarrott, W. M., Lyall-Wilson, E., McKnight, C. V., Miller, S., Pruchnicki, S., **Rao, A. H.**, Reed, C. B. (2017). Standard Operating Procedures: Flight Path Management (FPM) Air Carrier Operations. MITRE Technical Report. MTR170XXX.

GRANTS AND FELLOWSHIPS

2019-2021	Mitigating Mental Health Stigma in Higher Education Through Complementary Facilitated Dialogues, Remote Monitoring and Telehealth Counseling, X-Grant: President's Excellence Grant, Texas A&M University, Role: Co-Investigator, Amount: \$325,000
2017-2018	Weather Technology in the Cockpit, Federal Aviation Administration, The Ohio State University, Role: Co-PI, Amount: \$82,695
2016-2018	Pilot Decision-Making During Unexpected Events, Federal Aviation Administration, The Ohio State University, Role: Co-PI, Amount: \$288,400

AWARDS AND HONORS

- 2019 Best Presentation Award, Houston Human Factors and Ergonomics Society Symposium
- 2017 3rd Place, Virtual Poster Showcase, University Aviation Association, Role: Advisor
- 2016 Outstanding Researcher Award, Federal Aviation Administration
- 2015 Purdue Graduate Student Government (PGSG) Travel Grant, Purdue University
- 2015 College Engineering Travel Grant, Purdue University
- 2013 Magoon Excellence in Teaching Award, Purdue University
- 2010–2012 List of Teachers Ranked as Excellent by their Students (for five semesters), University of Illinois at Urbana-Champaign

INVITED TALKS

- 2019 A State-based Approach to Modeling Aviation Accidents, Texas A&M University, Department of Industrial & Systems Engineering.
- 2018 Retrospective Methods to Enhance the Future of General Aviation Safety, The Ohio State University, Center for Aviation Studies, College of Engineering.

CONFERENCE PRESENTATIONS

- 2018 Retrospective Analysis of Approach Stability in General Aviation Operations. 18th AIAA Aviation Technology, Integration, and Operations Conference, Atlanta, GA, June 2018.
- 2017 Resilient Capabilities in Single Pilot and Crewed Flight Operations, 7th Resilience Engineering Association (REA) Symposium, Liege, Belgium, June 2017.
- 2017 A Survey to Understand the Use of In-flight Weather Information Products and Services. 17th AIAA Aviation Technology, Integration, and Operations Conference, Denver, CO, June 2017.
- 2016 Comparing Hazardous States and Trigger Events in Fatal and Non-Fatal Helicopter Accidents. 16th AIAA Aviation Technology, Integration, and Operations Conference, Washington, DC, June 2016.
- 2016 Analyzing Maintenance Risk from Helicopter Accident Data. AIAA SciTech, 2016, San Diego, CA, January 2016.
- 2015 Identifying High-Risk Occurrence Chains in Helicopter Operations from Accident Data. 15th AIAA Aviation Technology, Integration, and Operations Conference, 2015, Dallas, TX, June 2015.
- 2012 Glide and Powered Flight Characteristics of Micro Air Vehicles from Experimental Measurements. AIAA Applied Aerodynamics Conference, 2012, New Orleans, LA, June 2012.

TEACHING EXPERIENCE (#Instructor on Record, *Guest Lecturer, †Teaching Assistant)

Texas A&M University

ISEN 210: Introduction to Industrial Engineering Design (Spring 2019; Fall 2019)[#]

Instructor for an introductory Systems engineering design class for industrial engineering majors. This class introduces sophomores to the formal systems engineering design process.

Arjun H. Rao

ENGR 491: Aggie Challenge (Fall 2018; Spring 2019, Fall 2019)[#]

Mentored multi-disciplinary student teams towards developing a usability-tested mHealth app with mental health applications. Co-instructed session on heuristics, user-centered design, usability testing, and prototyping.

ISEN 330: Human Systems Interaction (Spring, 2019)^{*}

Lectured modules on notifications, alarms, and display design.

ISEN 630: Human Operators in Complex Systems (Fall 2018)[#]

Lectured modules on warning and documentation, controls, and human error in complex socio-technical systems

The Ohio State University

AVN 4500: Aviation Senior Capstone (Spring 2018)[#]

Restructured the senior year aviation capstone class to provide additional time for student research. Solicited project ideas from aviation companies and stakeholders. Instructed a class of 41 undergraduate students and advised to research project teams.

AVN 3300: Aviation Human Factors & Safety (Fall 2017)^{*}

Instructed modules on theoretical models to understand aviation accident causation to a class of 30 aviation juniors and seniors. Wrote homeworks and exam questions relevant to my lectures.

Purdue University

AAE 251: Introduction to Aerospace Design (Spring 2013)[†]

Helped restructure a sophomore aerospace design course to make it more interactive, improving student-teacher accessibility. Led and facilitated discussion sessions on topics related to aircraft and spacecraft design.

AAE 351: Aerospace System Design (Fall 2012)[†]

Interacted with and advised student teams on the importance of writing good requirements. Carried out periodic reviews and assisted students with their conceptual designs. Assisted the instructor in writing homeworks and exams.

University of Illinois at Urbana-Champaign

CS 101: Introduction to Computer Science for Engineers (Fall 2010 to Spring 2012)

Instructed and assisted students (freshman and sophomore) in MATLAB and C programming. Taught multiple sections of an introductory Computer Science course for engineering majors. Assisted in writing exams, labs, and machine problems.

CS 101: Introduction to Computer Science for Engineers (Fall 2009)[†]

Interacted with 40 freshman aerospace engineers. Answered questions in office hours and served as a mentor to undergraduates. Guest lectured aircraft stability and control modules. Also helped organize class field trip.

SERVICE TO PROFESSION

Professional Societies:

- 2019-present Treasurer, Health Care Technical Group, Human Factors and Ergonomics Society (HFES)
- 2019-present Engagement Manager, Safety Technical Group, HFES
- 2019-present Committee Member, HFES Awards Committee
- 2018-present Committee Member, AIAA Young Professionals Awards Committee
- 2016-2018 Committee Member, General Aviation Technical Committee

Conference Organization:

- 2019-present Session Chair, HFES Annual Meeting
- 2018-present Planning Committee Member, AIAA Rising Leaders in Aerospace (RLA) sessions in AVIATION 2018 and 2019
- 2015-2018 Session Chair (various), AIAA AVIATION Conferences

Journal and Conference Reviewer:

- 2019-Present Reviewer, Human Factors and Ergonomics Society Annual Meeting
- 2019-Present Reviewer, Journal of Aerospace Information Systems
- 2017-Present Reviewer, Human Factors
- 2016-Present Reviewer, Safety Science
- 2016-Present Reviewer, Risk Analysis
- 2016-Present Reviewer, Transportation Research Record
- 2016-Present Reviewer, Journal of Aviation Technology & Engineering
- 2015-Present Reviewer, AIAA Aviation Technology, Integration, and Operations (ATIO) conferences

Student Groups & Departmental Service:

- 2013-2014 Representative to the Associate Dean, Aero Assist, Purdue University
- 2013-2014 Professional Development Chair, Aero Assist, Purdue University
- 2009-2010 Member of Graduate Student Advisory Committee, UIUC

PROFESSIONAL MEMBERSHIPS/AFFILIATIONS

- 2019-present American Society of Engineering Educators (ASEE)
- 2018-present Human Factors and Ergonomics Society (HFES)
- 2012-present American Institute of Aeronautics & Astronautics (AIAA)

SELECT MEDIA FEATURES

- 4/27/2016 Purdue University School of Aeronautics & Astronautics News, AAE PhD student Arjun

Arjun H. Rao

- Rao named a 2016 PEGASAS Outstanding Researcher,
<https://engineering.purdue.edu/AAE/news/2016/20160427-Arjun-Rao-PEGASAS>
- 3/31/2015 Purdue University School of Aeronautics & Astronautics Spotlight , School of AAE grad students present research at 2015 HAI Heli-Expo,
<https://engineering.purdue.edu/AAE/news/2015/20150331SpotlightSchoolofAAEgradstudentspresentresearchat2015HAIHeli-Expo>
- 3/30/2013 Purdue University School of Aeronautics & Astronautics Spotlight, Congratulations to Winners of the 2013 Magoon Excellence in Teaching Award,
<https://engineering.purdue.edu/AAE/spotlights/2013/20130301Magoon2013winners>

GRADUATE RESEARCH EXPERIENCE

- 2013-2016 Research Assistant, Value Reliability Safety & Sustainability Lab, Purdue University
- 2011-2012 Graduate Researcher, Humans Factors and Cognitive Engineering Group, University of Illinois at Urbana-Champaign
- 2009-2012 Graduate Researcher, Applied Aerodynamics Group, University of Illinois at Urbana-Champaign

STUDENTS SUPERVISED (¹ Mentor, ² Non-thesis Research)

Texas A&M University

Doctorate:

- 2018-Present Carl Markert¹, Industrial and Systems Engineering
- 2017-Present Julie Hammett¹, Industrial and Systems Engineering
- 2017-Present Samuel Bonet¹, Industrial and Systems Engineering
- 2017-Present Karim Zahed¹, Industrial and Systems Engineering
- 2015-Present Carolina Paras Rodriguez², Industrial and Systems Engineering

Masters:

- 2019-Present Margaret Fowler¹, Masters, Industrial and Systems Engineering
- 2017-2019 Patricio Rodriguez Paras¹, Masters, Industrial and Systems Engineering

The Ohio State University

- 2016-2018 Ryan Dittoe¹, Masters, Civil Engineering & Urban Planning
- 2016-2018 Rohan Sheth¹, Undergraduate, Aviation
- 2018 Robert Mendez², Undergraduate, Aviation
- 2018 Marcus Collier², Undergraduate, Aviation
- 2018 Kaila Weber², Undergraduate, Aviation

PROFESSIONAL CERTIFICATIONS

- 2018 Student Pilot Certificate (Federal Aviation Administration)
- 2012 Graduate Teachers Certificate (University of Illinois at Urbana-Champaign)