RONAK RANJITKUMAR MOHANTY

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EDUCATION

Doctor of Philosophy, Mechanical Engineering 2015 - 2021 (Expected)
Specialization: Precise Control for Spatial Design in AR/VR
Texas A&M University, College Station, Texas. GPA: 3.5/4

Bachelor of Science, Mechanical Engineering 2010 - 2014
Kalinga Institute of Industrial Technology, India. GPA: 8.2/10

WORK EXPERIENCE

Graduate Research Assistant Fall 2016 - Present
Lab: Mixed Initiative Design Lab , **Advisor**: Dr.Vinayak R. Krishnamurthy
Tentative Dissertation: Investigating Precision and Control in Spatial Interactions: Interactivity, Analytics, and Visualization
- Conducted quantitative and qualitative research on enabling precise spatial object manipulation in AR/VR
- Developed kinesthetically supported haptics algorithms for uni-manual (one-handed) and bi-manually (two-handed) coordinated high-precision spatial design tasks
- Designed close-range virtual interaction space using Motion Capture for precise manipulation in AR/VR

Graduate Mentor Spring 2020 - Present
- Mentored a masters (MS) student on a haptics based rehabilitation research currently under review at ASME IDETC 2020 and research extension towards ASME JCISE
- Mentored an undergraduate student on portable 3D printed prototyping project towards UIST 2020

Graduate Teaching Assistant Fall 2018
Course: MEEN 601 - Advanced Product Design , **Instructor**: Dr.Vinayak R. Krishnamurthy
- Coursework design, lecture preparation, assignments, and grading for 40 students
- Advised on and off-campus product design project teams

Graduate Teaching Assistant Fall 2017 - Spring 2018
Course: ENGR 491 - AggiE_Challenge, **Instructors**: Dr.Mathew Kuttolamadom, Dr.Bruce Tai, Dr.Vinayak R. Krishnamurthy
- Collaborated in design of a haptics-based virtual material model for a mixed-reality orthopedic surgical training
- Trained 20 (10 per semester) undergraduate students on OpenGL and Unity3D for VR based 3D design applications

Graduate Teaching Assistant Spring 2016
Course: MEEN 632/442 - Advanced Computer-Aided Engineering, **Instructor**:Yuval Doron
- Coursework design, lecture preparation, assignments, and grading for 30 students
- Trained graduate and undergraduate students for **3D modeling and analysis using Solidworks**

Graduate Teaching Assistant Spring 2016
Course: MEEN 441 - Design of Mechanical Components & Systems, **Instructors**: Mohammad Akram, Dr.Andreas Polycarpou
- Coursework design, lecture preparation, assignments, and grading for 30 students
- Trained undergraduate students for **3D modeling and analysis using ANSYS**

JOURNAL PUBLICATIONS

[**J2**] **Mohanty RR**, Krishnamurthy VR. **Kinesthetic Metaphors for Precise Spatial Manipulation: A Study of Object Rotation** ASME. (2019). *Under Review* in Journal of Computing and Information Science in Engineering.

[**J1**] **Mohanty RR**, Castillo RM, Ragan E, Krishnamurthy VR. **Investigating Force Feedback in Mid-air Sketching of Multi-planar 3D Curve-Soups.** ASME. (2019). Journal of Computing and Information Science in Engineering.

CONFERENCE PUBLICATIONS

[**C3**] **Mohanty RR**, Adhikari RR, Krishnamurthy VR. **Kinesthetic Perceptual Symmetry in Bimanual Interactions: An Exploratory Study** ASME. (2020).*Under Review* in International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.

[**C2**] Chen TJ, **Mohanty RR***, Rodriguez MAH*, Krishnamurthy VR. **Collaborative Mind-Mapping: A Study of Patterns, Strategies, and Evolution of Maps Created by Peer-Pairs.** ASME. (2019). International Design Engineering Technical Conferences and Computers and Information in Engineering Conference, 31st Design Theory and Methodology Conference. (*Best Paper Nominee*)

[**C1**] **Mohanty RR**, Bohari UH, Ragan E, Krishnamurthy VR. **Kinesthetically Augmented Mid-Air Sketching of Multi-Planar 3D Curve-Soups.** ASME. (2018). International Design Engineering Technical Conferences and Computers and Information in Engineering Conference, Volume 1B: 38th Computers and Information in Engineering Conference.

POSTERS, DEMOS, EXTENDED ABSTRACTS

[**P1**] **Mohanty RR**, Tai B, Kuttolamadom MA, Krishnamurthy VR. **Diffusion Based Material Model for Kinesthetic Feedback in Virtual Sculpting: Preliminary Exploration** ASME. (2019). International Design Engineering Technical Conferences and Computers and Information in Engineering Conference, 24th Design for Manufacturing and the Life Cycle Conference: Design Tool Showcase.

PROFESSIONAL SERVICE

Conference Proceedings

- **Reviewer**(4 papers) ASME IDETC/CIE 2020

UNPUBLISHED PROJECTS

Hybrid Visualization Tool for Orthopaedic Surgery Evaluation Summer 2019 - Present
Sponsor: Orthopaedic Research and Education Foundation, **PI:** Dr.V.R.Krishnamurthy, Dr.B.Tai
- Analyzed time-series data for force, angular velocity, drill speed, and overshoot distance for a surgical bone drilling process.
- Storyboarded different data visualization prototypes for senior surgeons and medical researchers
- Analyzed spatial data to provide motion correction using kinesthetic assistance for surgical training

Perceptual Motor Sweet Spot for Precise Spatial Manipulation Spring 2019 - Present
Sponsor: T3 - Texas A&M Triads for Transformation, **PI:** Dr.V.R.Krishnamurthy, Dr.S.Sueda, Dr.F.Quek
- Investigating close-range spatial manipulation interactions for identifying a co-located visual-motor space for precise object manipulation
- Exploring proxemics of user interaction space in conventional AR/VR/MR interfaces
- Publication under review at Graphics Interface 2020 conference

Kinesthetically Augmented Material Model for Precise Spatial Manipulation Fall 2017 - Spring 2018
Sponsor: AggiE_Challenge - Texas A&M Engineering, **PI:** Dr.V.R.Krishnamurthy, Dr.B.Tai
- Developed a proof-of-concept virtual material model for simulating drilling forces through kinesthetic feedback
- Investigated the material physics to aid precise spatial action in mixed-reality interfaces using the material model

PlanUp: Visual Analytics Tool for Crowdfunding Projects Spring 2018
Course: VIZA 689 - Data Visualization, **Instructor:** Dr.Eric Ragan
- Developed a web based tool using D3.js for detailed analysis of previous crowdfunded projects assisting in planning of new projects

A Machine Learning Approach to Wind Turbine Power Prediction Spring 2018
Course: ISEN 619 - Analysis and Prediction, **Instructor:** Dr.Yu Ding
- Explored, trained & tested multiple regression models on a given dataset for improving wind-power output prediction accuracy of wind-turbines

Modular Book-shelf Summer 2016
Course: MEEN 632 - Advanced Computer-Aided Engineering, **Instructor:** Yuval Doron
- Designed, analyzed, and prototyped a modular book-shelf using SolidWorks
- Developed and iterated multiple design concepts for the book-shelf able to carry the maximum load while retaining strength of the mechanical components, thus manufacturing one of the proposed design prototypes

3D Printed CubeSat Fall 2015
Event: Aggies Invent, **Host:** Texas A&M Engineering
- Designed, analyzed, and prototyped a pico satellite using SolidWorks for a Aggies Invent, a 48 hour design marathon event
- Manufactured a functional prototype using 3D printing

Design of a Hook-lift System for a Trailer Truck Spring 2015
Course: MEEN 632 - Advanced Computer-Aided Engineering, **Instructor:** Yuval Doron
- Designed, analyzed, and prototyped a simulation for a Hook-Lift System on a trailer truck using SolidWorks - Developed and iterated multiple design concepts for the Hook-Lift System able to carry the maximum load while retaining strength of the mechanical components

Condition Testing Of an IC Engine Spring 2014
Senior Year Project, Kalinga Institute of Industrial Technology, India, **Advisor:** Dr.P.C.Mishra
- Collaborated in research, development, and design of an emission testing rig in order to understand engine tribology and its effect on emissions
- Collaborated in implementation, data collection, and analysis of emission data across multiple motorbikes using HORIBA emission analyser.
- Evaluated emission data with respect to Central Pollution Control Board, India for gases like HC, CO, CO2 and NOx.

First Time Buy Off (FTBO) Improvement Summer 2013
Mahindra Vehicle Manufacturers Ltd., Chakan, India
- Collaborated with the Manufacturing Quality and Reliability Team to reduce assembly line chassis defects caused due to spot welding machines
- Collaborated in the research, design, and development of jigs, and fixtures such as gun guides to mitigate unintentional damage due to weld guns

Electric Motorbike (Showcased at Indian Science Congress 2014) Fall 2011 - Spring 2013
Capstone Design Project, Kalinga Institute of Industrial Technology, India, **Advisor:** Dr. I.Panigrahi
- Collaborated in research, design, and development of two electric motorbikes presented at Indian Science Congress 2012.
- Guided and advised freshmen undergraduate engineering students in manufacturing of mechanical components, jigs, and fixtures.
- Guided and advised freshmen undergraduate and sophomore engineering students design team for building two electric bike prototypes.

HONORS & AWARDS

Mechanical Engineering Graduate Student Travel Award Spring 2018
NSF scholarship for Summer School for ESD research methods Summer 2017

OUTREACH ACTIVITIES

Educational Outreach

- **Outreach Officer, ACM SIGCHI - TAMU Chapter** Fall 2018 - Present
  Texas A&M University, College Station, Texas
  - Maintain relations across HCI labs in the Department of Computer Science, Visualization, Mechanical Engineering, and Industrial Engineering.
  - Conduct workshops, faculty, and guest talks for university students.

- **Volunteer** Summer 2018
  Texas A&M University, College Station, Texas
  - Assisted Dr.Krishnamurthy in conducting a one-day workshop in collaboration with the Youth Adventure Program (YAP) at Texas AM University for introducing high-school students to brainstorming, idea generation, mid-air modeling and hand-held 3D printing

- **Volunteer** Spring 2018
  Rock Prairie Elementary School, College Station, Texas
  - Assisted Dr.Krishnamurthy in demonstrating 3D sketching application (see conference paper [C1]) and hand-held 3D printing pen to students at the Annual Discovery Night organized by Rock Prairie Elementary School at College Station, Texas

- **Volunteer** Summer 2017
  Texas A&M University, College Station, Texas
  - Assisted Dr.Krishnamurthy in conducting a one-day workshop in collaboration with the Youth Adventure Program (YAP) at Texas AM University for introducing high-school students to brainstorming, idea generation, mid-air modeling and hand-held 3D printing

- **Volunteer** Spring 2017
  Rock Prairie Elementary School, College Station, Texas
  - Assisted Dr.Krishnamurthy in demonstrating interactive modeling software zPots developed by him and hand-held 3D printing pen to students at the Annual Discovery Night organized by Rock Prairie Elementary School at College Station, Texas

Social Outreach

- **Advisor, Indian Graduate Students Association** Spring 2019 - Present
  Texas A&M University, College Station, Texas

- **President, Indian Graduate Students Association** Fall 2018 - Spring 2019
  Texas A&M University, College Station, Texas

- **Vice President, Indian Graduate Students Association** Fall 2016 - Spring 2018
  Texas A&M University, College Station, Texas

- **Director, Indian Graduate Students Association** Spring 2015 - Spring 2016
  Texas A&M University, College Station, Texas