

# PRANOVE BANDI

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## SUMMARY:

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- A passionate Automotive engineer and car enthusiast with a specialization in Human factors and vehicle ergonomics seeking an opportunity in the Automotive Industry where I can utilize my skills for organizational and personal growth
- Performing Research project on identifying intuitiveness of ADAS warnings on HUD-Head up Displays
- Working towards publishing research work at the SAE-Detroit
- Experience in working with High-Fidelity Simulators with Human Subjects
- Studied the concepts of Cluster Design and worked for the development of Automotive Instrument Cluster (Digital Clusters)
- Knowledge of Evaluation Practices of HMI's like Heuristic Evaluation, Cognitive Walkthrough and Task Analysis
- Familiar with engineering software packages such as AutoCAD Fusion 360, CATIA v5, Altair HyperMesh, Siemens JACK
- Strong background in Automobile Engineering, especially Vehicle Ergonomics, User Interface Design, Automotive-Integrated Systems, Product Development, Production systems, Vehicle Assembly, Automotive Manufacturing Processes, Total Quality Management, Finite Element Analysis, Vehicle Dynamics, Automotive Powertrains, Automotive Safety

## EDUCATION:

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### University of Michigan – Dearborn

September 2016 - August 2018

*MSE (Master of Science in Engineering) in Automotive Systems Engineering*

GPA – 3.56

### Related Courses:

- User Interface Design and Analysis
- Automotive Integrated System
- Vehicle Ergonomics
- Vehicle Packaging
- Total Quality Management & Six Sigma
- Program Management
- Digital Manufacturing
- Automotive Manufacturing Processes
- Automotive Powertrains

### Lakireddy Bali Reddy College of Engineering, India

August 2011 – April 2015

*Bachelor of Technology in Mechanical Engineering*

GPA – 3.58

## SKILLS:

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**Basic tools:** Microsoft Word, Excel and PowerPoint, Adobe Photoshop, RTI SIM Creator, Altia Design, Unity

**Modelling and Programming:** AutoCAD Fusion 360, CATIA, ANSYS, CNC programming, Hyper Mesh, Siemens JACK

**Forms:** Test Cases, FMEA and DFMEA

## EXPERIENCE:

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### Research Assistant at IAVS (Institute for Advanced Vehicle Systems) at UM-Dearborn

Since August 2017

- Working for a research project on investigating intuitiveness of new Heads-Up Display integrated with ADAS warnings
- Worked for the development of Comfortability factors for an automotive seat
- PEERRS and IRB to work with Human Subjects

### FSAE-Electric University of Michigan Dearborn

November 2016 – October 2017

- Team Member of Ergonomics & Quality Assurance Team
- Worked for the development of driver package for chassis design considering driver's anthropometric measurements

### Toyota Kirloskar Motors, (Graduate Trainee) - Prasadampaadu, India

August 2015 – May 2016

- Product Development Intern for 8 months
- Worked towards development of face-lift model for Toyota Innova
- Application of Quality tools to access product quality, inventory control and floor management

### Research Assistant -Lakireddy Bali Reddy College of Engineering- Vijayawada, India

August 2014 – February 2015

- Worked on Cognitive Distractions using subjects on a driving simulator
- Studied Possible distractions the driver experiences while driving on a highway

## PROJECTS:

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### Capstone Project: Researching the attitude of drivers towards HUD integrated with ADAS warnings

December 2017

- Designed a New Heads up display interface in accordance with SAE J 2400
- Designed new digital interfaces for HDD and HUD using Altia design and Unity 3D for emphasized ADAS warnings
- Investigating the intuitiveness of warnings with respect to modality, location and adjustability
- Mental workload of the driver is correlated with the EORT and subjective evaluations after driving simulator for each case

### Interior Packaging of 8-way Seat adjustment controls for Automotive Seats

September 2017-December 2017

- Applied quality tools like QFD and KANO model to derive the customer specific needs
- Selected BMW 325i as reference vehicle, benchmarked with its competitors, developed QFD from surveys and blogs
- Identified Functional Grouping of controls pleases customers from a Packaging Engineer point of view.

### Occupant Package Development for Pick-up Truck based on Anthropometric data of prospective driver population

September 2017-December 2017

- Benchmarked pick-up trucks to generate the dimensions of passenger cabin and interior package dimensions
- Using Customer Surveys, derived possible improvements that can be made to increase the customer satisfaction
- Designed the Total interior package establishing SgRp, Eyellipses and Hand-reach zones etc.

**Usability Testing of Automotive Infotainment systems with different modalities- Touch Screen Infotainment system and Conventional Display with physical buttons and knobs system** January 2017-April 2017

- Selected recent models' cars in which type-2016 Buick Envision for Touch type and 2016 Ford Focus Sedan for Buttons type
- Using Subjective Analysis, analyzed the intuitiveness by time taken and number of errors committed by subjects
- Compared the time taken of each subject with an expert (owner, who uses the car daily)
- 77% subjects found the Touch Screen Infotainment system to be more Intuitive, as they committed less errors using it.

**Verifying the time taken by Expert users of Automotive Infotainment systems with GOMS-Keystroke Model** January 2017-April 2017

- Experts considered are the Respective car owner, who use their car daily and can operate the system with no errors
- Using Task analysis, experts are asked to perform a task and time is recorded
- Time of operation as per GOMS-keystroke model is calculated by GOMS operators used in the task
- Results showed that the experts considered took more time of 6 seconds than the GOMS-keystroke suggested time

**User Interface Testing of 2014 Volkswagen Jetta RNS 510 Infotainment System to determine the Extent of Usability and Intuitiveness of the system and Redesigned the layout as per Interface guidelines** January 2017-April 2017

- Selected the specific model after making a detailed survey using sources like Volkswagen Forum, car buzz etc.
- Using Subjective Analysis, analyzing the intuitiveness of the system using the time taken by a subject to perform an operation
- Performing Data analysis from the data acquired by responses of different driver population
- Redesigned the Existing layout into more simple and user-friendly design by changing the appearance and providing feedback

**Driver Package evaluation based on Anthropometric data and SAE Standards** September 2016 – December 2016

- Computed SAE J1100 vehicle seating dimensions e.g. seating height, seat track length, seat width, head clearances, etc
- Verified the dimensions to the drivers- 95<sup>th</sup> percentile Male and 5<sup>th</sup> percentile Female anthropometric data to evaluate the driver seating package
- Identified that selected vehicle 2014 Nissan Altima cannot comfortably accommodate 95% Male

**Ergonomic validation of Door Handles and Seats of passenger cars** September 2016 – December 2016

- Conducted subjective analysis using Analytical Hierarchical Method on Lumbar support and Door handle height for 95<sup>th</sup> percentile Male and 5<sup>th</sup> percentile Female
- Conducted subjective analysis on Seat Comfort and Ease of opening door with Winter Glove using Thurstone's Method
- Summarized the findings using tables and plots and researched the possible design changes on the vehicles

**Estimation of Binocular and Monocular Obscurations caused by A, B, C pillars of a recent passenger car for tall and short driver's eye location with Laser Fixture as per SAE J1050** September 2016 – December 2016

- Conducted an ergonomic study on measurements of visibility issues related to the driver's field of view
- Measured the obstruction caused by left and right a, b and c pillars using laser fixture as per SAE J1050 appendix C
- Suggested to incorporate 360 degrees Virtual Windscreen concept of Jaguar Land Rover

**Ergonomic validation of vehicle controls and displays evaluation checklists** September 2016 – December 2016

- Conducted an ergonomics evaluation of selected controls and displays by subjective analysis using magnitude scales located on the driver's door, the instrument panel, and the steering column, of a current production car
- Highlighted the ergonomics characteristics and operability issues of the selected controls and displays
- Developed Ergonomics evaluation summary chart, suggested ergonomic improvements to the selected controls and displays

**Benchmarking & developing Preliminary design specifications of 2022 Target Vehicle** September 2016 – December 2016

- Selected a Reference vehicle (2017 Chrysler Pacifica), its existing competitors and benchmarked them with the target vehicle
- Performed Customer survey to identify attractive features anticipated by customer using Kano analysis
- Weighted Pugh diagram is used to determine the specific importance of each vehicle attribute with that of its competitor's

**Quality Function Deployment (QFD): Development of functional requirements from customer requirements for the Instrument Cluster of 2017 Chrysler Pacifica** September 2016 – December 2016

- Determined the customer needs and derived the functional specifications of the Instrument Panel with Cluster
- Benchmarked the chunks in two other vehicles of the same segment and identified the possible development of cluster
- Determined the target specifications and important design variables for the selected chunk

**Business plan development and Technology Plan of the Proposed 2022 Target vehicle** September 2016 – December 2016

- Designed an idea of Fully Electric Minivan and developed Technology plan, predicted various technical and budget risks
- Performed cash flow analysis and revenue analysis and developed Gantt Chart for Product Kick-off Date and Job#1 date
- Calculated Selling price and forecasted quarterly sale projections after vehicle launch

**Case study on Cognitive distractions leading to road accidents using wet EEG system** April 2013-December 2013

- Performed case study to evaluate the extent of distractions caused by Roadside Advertisings (Hoardings and Bill Boards)
- Studied the possible distractions and errors made by the drivers while performing the test on simulator

**PROFESSIONAL ACCOLADE:**

- Received Non-Resident Graduate Tuition Scholarship-Winter 2018, Fall 2017, Winter 2017 & Fall 2016
- Awarded Best Outgoing Student in Undergraduate University-April 2015
- Recipient of Merit Scholarship for Academic Excellence in Undergraduate University-June 2012