# UTKARSHA MOHAN

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## SUMMARY

Human Factors Engineer and UX Researcher with 2+ years of experience applying human-centered design and empirical methods across health tech, e-governance, and media platforms. Currently pursuing an MS in Human Factors and Ergonomics at Virginia Tech, with hands-on research in usability testing, eye-tracking, and sensor-based ergonomic evaluations. Skilled in experimental design, task analysis, and translating behavioral and physiological data into actionable product insights. Passionate about designing intuitive systems that optimize user performance and safety in complex environments — including in-vehicle HMI and digital mobility systems.

## PROFESSIONAL EXPERIENCE

**Occupational Ergonomics and Biomechanics Lab, Virginia Tech** **January 2024-Present**

*Research Assistant/Lab Assistant*

- Conducted hardware-focused usability and ergonomic evaluations of wearable exoskeletons simulating industrial use cases (roofing, mining), applying human capability and cognitive workload models.
- Collected and analyzed multimodal sensor data (IMU, EMG, Vicon) to assess motion constraints, user comfort, and task efficiency.
- Contributed to IRB drafting, study protocol design, participant preparation, and risk documentation to ensure reproducibility and participant safety in high-load task scenarios.
- Collaborated with interdisciplinary teams to provide evidence-based recommendations for improving wearable system usability and ergonomic fit.
- Assisted in refining data collection procedures and documentation to ensure consistency across study sessions and facilitate reproducible research.

**Fractal Analytics, Bengaluru, India** **7th July 2021 – 12th April 2023**

*User Experience Designer/Imagineer*

- Led UX and usability research for UMANG, a national e-governance chatbot used by over 100 million citizens, integrating 19+ services across app, web, and IVR platforms.
- Conducted mixed-method research (usability testing, task analysis, survey feedback) to uncover cognitive load issues, reduce task friction, and improve accessibility.
- Designed and tested multilingual, multimodal conversational flows, improving usability and task completion rates for users across varying literacy levels and technical proficiency.
- Created Bot Analytics dashboards to track user journeys, identify drop-offs, and analyze pain points, converting behavioral data into targeted design improvements.
- Partnered with engineers, product managers, and government stakeholders to align interface behavior with user feedback, accessibility needs, and privacy regulations.

**Viacom18 India Pvt Ltd, Mumbai, India** **30th March 2021 – 30th June 2021**

*Growth Product Intern on Voot, a streaming app.*

- Conducted eye-tracking usability studies with diverse users to identify high-attention zones during campaign periods, optimizing content layout and visual hierarchy for improved interaction.
- Analyzed behavioral data using Mixpanel to detect friction in sign-up/login flows; led redesigns that improved user activation by 8% month-over-month.
- Identified navigational bottlenecks and decision delays through task-flow analysis, informing micro-interaction adjustments for smoother task completion.
- Conducted audience segmentation by OS and gender to support personalized UX and ad strategy—guiding differentiated content and design paths.

## EDUCATION

**Virginia Tech, Blacksburg, Virginia, USA (GPA – 3.91/4.0)**

August 2023 – May 2025 (Expected)

*Master of Science in Industrial and Systems Engineering with Specialization in Human Factors and Ergonomics*

**RV College of Engineering, Bangalore, India (GPA – 3.2/4)**

August 2017 - May 2021

*Bachelor of Engineering in Mechanical Engineering, First Class with Distinction*

## COURSES AND CERTIFICATIONS

- Fall 2024: Usability Engineering, AI for Systems Engineers
- Spring 2024: Human Factors Research, Cognitive Work and Task Analysis, and Affective Design and Computing
- Fall 2023: Human Information Processing, Human Physical Capabilities, and Human Factors System Design

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## PROJECTS

**Analyzing Performance and Communication Dynamics in Human-Human and Human-Robot Teams: *MS Thesis***

- Conducted a mixed-method research study evaluating team performance, cognitive workload, and communication dynamics in human-human vs. teleoperated robot collaboration during a wire assembly task.
- Collected and analyzed physiological (EMG), motion (IMU), and survey data (NASA TLX, SART, BORG) to assess cognitive and physical task demands.
- Used JMP, MATLAB and Python for statistical comparisons across conditions (e.g., task complexity, collaboration mode), evaluating differences in perceived workload, accuracy, and movement profiles.
- Performed qualitative video coding of team interaction recordings to extract behavioral themes and identify usability pain points in robot-mediated coordination.

**Integrated-Interactive Digital Wellness System: Hokie Wellness** **September 2024 – December 2024**

- Investigated low participation in campus wellness programs through survey research (n=68) and contextual inquiries, identifying friction in the multi-step registration process.
- Conducted moderated usability testing with Figma prototypes and quantified success rates, error rates, and task times to evaluate alternative designs.
- Used A/B testing and post-task SUS scores to assess accessibility and engagement across redesigned interfaces; new design improved task completion rate by 30%.
- Iteratively refined interface layouts and content structure, aligning with human-centered design principles to support mental workload reduction and better navigation.
- Presented findings and implementation plan to university stakeholders, influencing rollout strategy for digital wellbeing initiatives.

**Cognitive Work Analysis of Blacksburg Transit System** **January 2024 – May 2024**

- Conducted a Cognitive Work Analysis (CWA) to evaluate transit operations, focusing on route optimization, fleet allocation, and passenger load management.
- Developed abstraction hierarchies and decision ladders to analyze work domain constraints and improve coordination between drivers, control rooms, and maintenance teams.
- Proposed human-centered design recommendations to enhance system efficiency, emergency response, and passenger experience in high-demand scenarios.

**Conversational UX Research: UMANG Chatbot** **September 2021 – March 2023**

- Designed, tested, and refined multimodal conversational flows for UMANG, India's e-governance chatbot.
- Conducted task analysis, usability testing and survey-based research to evaluate cognitive load and optimize interaction efficiency targeting low-literacy and first-time users.
- Informed design decisions through behavioral analytics dashboards and user journey mapping, improving task completion rates.

## TECHNICAL SKILLS

- **Research Methods:** Mixed-Methods Research, Usability Testing (moderated/unmoderated), Surveys, Cognitive Task Analysis, A/B Testing, Behavioral Analytics, Field Studies, Heuristic Evaluation, IRB Protocols, Pupillometry
- **Tools & Technologies**: Figma, JMP, Python, SQL, Microsoft PowerBI, SPSS (basic), Mixpanel, Microsoft Excel, Google Forms, SurveyMonkey (familiar), Tobii Pro Nano
- **UX & Human Factors:** User-Centered Design, Human-Computer Interaction (HCI), Cognitive Ergonomics, Workload Assessment (NASA-TLX, SART, BORG), Conversation Flow Design, Experimental Design, Task Analysis, Quantitative Analysis, Qualitative Coding, Data Visualization, Sensor Data Processing, AOI Analysis,
- **Soft Skills:** Stakeholder Engagement, Cross-Functional Collaboration, Insight Synthesis, Research Communication, Time Management

## LEADERSHIP EXPERIENCE

**Communication Director, HFES VT Student Chapter** **July 2024 - Present**

- Managed social media platforms, creating posts and campaigns to promote events and initiatives, enhancing chapter visibility and participation, collaborating with faculty and members to foster student engagement and promote human factors principles.

**Head of Marketing, Entrepreneurship Cell, RV College of Engineering** **August 2019 - July 2020**

- Spearheaded online and college-based promotion campaigns for 7 startups, resulting in measurable increases in student engagement and startup visibility.

**Chief Engineer, Open-Source Vehicle (OSV) Project – Ashwa Racing (Formula Student Team), RV College of Engineering** **November 2017 – July 2019**

- Led a multidisciplinary team of students to develop concept designs for an open-source electric vehicle to compete in a competition organized by the Scientific and Technological Research Council (TÜBİTAK), Turkey.