# Praneet Kumar Sahoo

Windsor – Ontario – Canada

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## Education

**Master of Science in Kinesiology (Grade - 90/100)**
Human Factors, University of Windsor, Canada
*September 2022 - April 2024*

**Bachelor of Technology in Biotechnology (CGPA - 8.98)**
Biotechnology, National Institute of Technology Durgapur, India
*August 2018 - May 2022*

## Research Interest

Self Driving Vehicles, Automotive Systems, Human Factors, Human-Machine Interface (HMI), User Experience (UX), Virtual reality, Machine Vision, Artificial Intelligence, Human Centric Design

## Technical Skills

- **Tools:** Figma, Unreal Engine, MATLAB, CATIA, Ansys, GIMP, SPSS
- **Programming Languages & Frameworks:** Python, R Studio (R), C, C++, Java, Pytorch, Tensorflow

## Work Experience

- **Research Associate** (*Human System Labs, University of Windsor, 2024-Present*): Project lead, experiment design, data collection, analysis, literature reviews, report authoring, methodology development, team management, mentoring.
- **Research Assistant** (*Human System Labs, University of Windsor, 2022-24*): Data collection, analysis, experimental support, report drafting, team collaboration.
- **Graduate Assistant** (*Dept. of Kinesiology, University of Windsor, 2022-24*): Faculty support, teaching assistance, administrative tasks.

## Projects

**Real-Time Driver Behavior Detection Using AI and Machine Vision**
*Human System Labs*
*2025-Present*
- Developed software to analyze driver behavior using YOLO, MediaPipe, Pytorch & Tensorflow.
- Integrated gen-AI APIs to assess glance allocation and distractions for road safety analysis.
- Studied driver behavior patterns and distraction levels across different driving modes using machine vision.

**Real-Time Posture Detection & Feedback Using Machine Vision**
*Human System Labs*
*2025-Present*
- Built an OpenPose-based system for real-time posture monitoring in healthcare settings.
- Designed an Arduino Uno R4 WiFi device to alert on posture risks, improving worker safety.

**Evaluating Cognitive Workload: Projection vs. Software Based Guidance**
*Human System Labs & Atlas Copco*
*2025-Present*
- Compared UX of laser projection vs. software guidance for EV battery pack assembly.
- Assessed eye metrics to evaluate impact on engagement, efficiency, and workload.

**Workload Analysis Across Industrial Workstations**
*Human System Labs, TRQSS & Atlas Copco*
*2025*
- Collected worker data to assess workload variations across workstations and shifts.
- Analyzed findings to optimize performance efficiency in industrial settings.

**Comparing Cognitive Workload Across Different Modalities of Instruction**
*Human System Labs*
*2024*
- Created a VR environment to study workload in assembly manufacturing processes.
- Compared cognitive workload and performance across laser, pictorial, and video guidance.

### Transportation Safety: Driver Distraction in BIAs and School Zones
*Human System Labs & Windsor Police Department*                    *2024*
- Analyzed driver distraction patterns in BIAs and school zones to enhance traffic safety.
- Partnered with police to develop data-driven measures reducing transportation risks.

### Blink Detection AI for Driver Safety
*Human System Labs*                    *2024*
- Developed a CNN-based blink detection model using NVIDIA TinyCUDA.
- Processed real-time video to enhance driver safety awareness.

### Driver Workload in Manual vs. Automated Driving
*Human System Labs & Ministry of Transportation, Ontario*                    *2023*
- Compared driver attention and cognitive load on ON-401 for manual and automated vehicle safety.
- Analyzed physiological data such as heart rate, DRT, and eye tracking data.

### Situation Awareness and Cognitive Workload in VR Driving
*Human System Labs*                    *2022-24*
- Designed a VR based autonomous driving scenario to study situational awareness(SA).
- Assessed cognitive workload and SA using eye tracking, NIRS, and DRT.

### Off road vehicle designing & driver ergonomics for SAE BAJA
*NIT Durgapur & SAE BAJA*                    *2019-21*
- Led team strategy & oversaw complete vehicle design as the Vice-Captain
- Designed & manufactured a BAJA vehicle and assessed ergonomics using RULA and REBA.
- Fabricated and tested suspension systems to optimize driver comfort and vehicle stability.
- Evaluated roll cage design and crash dynamics to enhance driver protection and fabricated it.

## Publications

- Li, Y., Sahoo, P., Vasta, N., & Biondi, F. (2025). "Stabilization Time after Mode Switch in Conditionally Automated Driving: Focusing on Drivers' Cognitive Load and Visual Attention", *Transportation Research Record*.

- F. Biondi, P.K. Sahoo, N. Jajo (2025) "The Distraction Potential of Driving a Partially Automated Vehicle through a Construction Zone", *Scientific Reports*.

- P.K. Sahoo, A.J. Bain, F.N. Biondi (2024) "Investigating the Interplay between Cognitive Workload and Situation Awareness during Full Driving Automation", *Theoretical Issues in Ergonomics Science*.

## Achievements

- **Mitacs Award (2024-25)**: Awarded for research collaboration and innovation.
- **Ontario Graduate Scholarship (2023 & 2024)**: Awarded for academic excellence and research potential.
- **Dean's Honor Roll (2023)**: Recognized for exceptional graduate coursework performance.
- **Ignite Scholarship (2023)**: Received for leadership and academic community contributions.
- **University of Windsor Entrance Scholarship**: Awarded for academic excellence upon admission.

## Volunteering

- **Food Distribution for the Homeless** Volunteered to distribute food to homeless individuals, helping to meet basic needs and promote community welfare.
- **FIRST Robotics** Provided on-field technical assistance to participating teams, troubleshooting technical issues, and offering guidance to ensure smooth operation during competitions.
- **Windsor Symphony Orchestra** Volunteered in various capacities to support performances and community outreach initiatives, enhancing the cultural landscape of the region.

## Hobbies & Activities

Reading, Listening to Podcasts, Martial Arts, Combination Boxing, Calisthenics and Cube Solving