Rajkumar Darbar

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Education

Ph.D. in Computer Science   Dec 2017 – Sept 2021
INRIA Bordeaux & Université de Bordeaux, France

Thesis: *Extending Interaction Space in Augmented Reality:*
Contributions in Optical See-Through and Projection-Based Augmented Environments

Committee: Martin Hachet (advisor), Pascal Guitton (co-advisor), Marcos Serrano,
Gilles Bailly, Caroline Appert, Céline Coutrix

M.S. (by Research) in Computer Science   Jan 2013 – May 2016
Indian Institute of Technology Kharagpur, India

Thesis: *Interactions with Smartphones and Smartwatches:*
Context-Awareness, Text Entry Interfaces, and Input Beyond Touch

B.Tech in Information Technology   Aug 2008 – June 2012
West Bengal University of Technology, Kolkata, India

Experience

Computer Graphics & Engine Development (Independent)   Jan 2025 – Dec 2025

- Implemented geometric primitives and real-time rendering pipelines,
  including Bézier curves, lighting models, shadow mapping, and deferred rendering.
- Built ray tracing and Monte Carlo path tracing systems with GPU compute shaders.
- Developed physics and collision systems including broad- and narrow-phase detection,
  spatial acceleration structures, and real-time cloth simulation.

Postdoctoral Researcher   Apr 2022 – Aug 2024
CNRS, Paris, France
Built a multi-user VR system with shared eye-gaze cues for molecular visualization.

Summer Intern   June 2016 – Jan 2017
Samsung R&D Institute, Bangalore, India
Implemented a smart-ring–based interaction system for IoT device control.

Research Interests

Human–Computer Interaction (HCI) • Augmented Reality (AR) • Virtual Reality (VR)

Selected Publications

[1] **GazeMolVR: Sharing Eye-Gaze Cues in a Collaborative VR Environment for Molecular Visualization**
R. Darbar, H. Santuz, A. Taly, M. Baaden
International Conference on Mobile and Ubiquitous Multimedia (MUM), 2024

[2] **OnArmQWERTY: An Empirical Evaluation of On-Arm Tap Typing for AR HMDs**
R. Darbar, X. Hu, X. Yan, Y. Wei, H.-N. Liang, W. Xu, S. Sarcar
ACM Symposium on Spatial User Interaction (SUI), 2024

[3] **HoloCMDS: Investigating Around Field-of-View Glanceable Commands Selection in AR-HMDs**
R. Darbar, A. Prouzeau, M. Hachet
IEEE VR Abstracts and Workshops (VRW), 2022

[4] **Exploring Smartphone-enabled Text Selection in AR-HMD**
R. Darbar, A. Prouzeau, J. Odicio-Vilchez, T. Lainé, M. Hachet
Graphics Interface Conference (GI), 2021

[5] **DroneSAR: Extending Physical Spaces in Spatial Augmented Reality using Projection on a Drone**
R. Darbar, J. Sol Roo, T. Lainé, M. Hachet
International Conference on Mobile and Ubiquitous Multimedia (MUM), 2019

[6] **PressTact: Side Pressure-Based Input for Smartwatch Interaction**
R. Darbar, P. Kr. Sen, D. Samanta
ACM CHI Extended Abstracts (CHI EA), 2016

[7] **Using Hall Effect Sensors for 3D Space Text Entry on Smartwatches**
R. Darbar, P. Kr. Sen, P. Dash, D. Samanta
International Conference on Intelligent Human Computer Interaction (IHCI), 2015

[8] **SurfaceSense: Smartphone Can Recognize Where It Is Kept**
R. Darbar, D. Samanta
Indian Conference on Human Computer Interaction (IndiaHCI), 2015

Technical Reports	**RingIoT: A Smart Ring Controlling Things in Physical Spaces** R. Darbar, M. Choudhury, V. Mullick Samsung R&D Institute — Internship Report, 2016
Technical Skills	• **Programming & Scripting Languages:** C#, HLSL (Compute Shaders), Java, Python • **Development Tools:** Unity, Visual Studio, Android Studio, Git • **Hardware Expertise:** HTC Vive, HoloLens, Arduino, OptiTrack • **UX Research:** R / RStudio, SPSS, thematic analysis of user studies
Awards & Fellowships	• **INRIA Bordeaux:** Ph.D. fellowship. • **Microsoft Research India:** Travel grant to attend CHI 2016. • **SRIC–IIT Kharagpur:** Fellowship for M.S. (by Research) studies.
Extra-Curricular Activities	• **Paper Reviewer:** CHI (2023, 2025), VR (2025), VRST (2022), SUI (2022), INTERACT (2019). • **Student Volunteer:** UIST (2018), MobileHCI (2018). • **Teaching Assistant:** AR/VR course, Université de Bordeaux (2019–2020). • **SIGCHI Summer School Participant:** Research Methods for Text Entry and Interaction Techniques, IIT Bombay (2018).