

Rajkumar Darbar

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🌐 <https://rajkdarbar.github.io/>

📍 Paris, France

Education

Ph.D. in Computer Science

INRIA Bordeaux & Université de Bordeaux, France

Dec 2017 – Sept 2021

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

Indian Institute of Technology Kharagpur, India

Jan 2013 – May 2016

Thesis: *Interactions with Smartphones and Smartwatches:*

Context-Awareness, Text Entry Interfaces, and Input Beyond Touch

B.Tech in Information Technology

West Bengal University of Technology, Kolkata, India

Aug 2008 – June 2012

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).