

ROHIT K. DUBEY

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OBJECTIVE

Postdoctoral researcher with 12 years of research and industry experience in cognitive modeling of human behavior and AI enabled technology. Actively seeking opportunities in the dynamic domains of Ethical AI and groundbreaking ML algorithms.

EDUCATION

Ph.D.: D-INFK, ETH Zurich 2016 - 2020

Thesis: Cognitive Modeling of Information Sources for Human Wayfinding Under Uncertainty.

Supervisors: Asst Prof. Robert W. Sumner (Disney), Prof. Christoph Hoelscher (ETHZ), and Prof. Mubbasir Kapadia (Rutgers University)

M.Sc.: Digital Media Technology, Nanyang Technological University, Singapore 2007- 2008

Thesis: Path-Finding in Games — **Grade:** CGPA: 3.93/5.0

Relevant Coursework: 3D Graphics, OpenGL, Agent Based Model, and Path Planning

B. Eng. in Computer Science & Engineering: VTU, India 2001- 2005

Grade: First Class with Distinction

Relevant Coursework: Data Structure, Applied Maths, Neural Network, and Logic Design

SKILLS

Research Fields Cognitive Computation, Ethics in AI, VR, Human Computer Interaction, Traffic Modeling

Scientific Skills Reinforcement Learning, Data Scientist, Behavioural Experiment, Statistical Analysis

Technical Skills Python, C#, OpenCV, Pytorch, GYM, C++, MATLAB, R, SUMO, Unity3D, Nao SDK

EXPERIENCE

Postdoctoral Researcher Sep, 2022 – ongoing

ETH, Zurich *Zurich, Switzerland*

- My research spans various fields, including Semantic Urban Elements, Adaptable Infrastructure, Traffic Modeling, Ethical AI, and Participatory Co-creation.
- Successfully completed the intra-disciplinary project Semantic Urban Elements (SUE) and assumed a leadership role in defining its core principles, with a focus on placing co-creation and participatory democracy at the center.
- Lead research on adaptable infrastructure, employing deep multi-agent reinforcement learning to improve overall efficiency in mixed-traffic scenarios.
- I've submitted a Branco Weiss research proposal under the title "NeuroNavX: Intelligent Behavior Exploration through Spatial Navigation." NeuroNavX aims to integrate theories that define intelligent behavior in humans.

Postdoctoral Researcher Oct, 2020 – Aug, 2022

Technical University of Munich *Munich, Germany*

- Team Lead & postdoctoral researcher at Computational Modeling and Simulation chair. My research focused on Crowd simulation, Human Wayfinding, and Computer-Aided Design Architecture.
- Provided mentorship and research direction to five PhD students.
- Participated in collaborative writing for an ERC Consolidation project grant.

PhD Researcher July, 2016 – Sep, 2020

D-INFK, ETH Zurich *Zurich, Switzerland*

- Engaged in foundational research utilizing computational cognitive modeling to improve human wayfinding under uncertainty, incorporating VR and HMD-based behavioral experiments.

- Created the "AUTOSIGN" software, which facilitates automatic signage design for large-scale indoor environments while maintaining designer involvement throughout the process.
- Collaborated with supervisors and colleagues, making substantial contributions to proposal writing, leading to the successful acquisition of two research grants.

Research Engineer

Jun, 2013 – Jun, 2016

CSI, Institute for Infocomm Research, A*Star

Singapore

- Developed software and patents within biometrics-based security systems, specializing in anti-spoofing fingerprint software to counteract hacking on mobile phones.
- Achieved recognition for the software, leading to its selection by Samsung and participation in internal testing conducted by the Samsung Team in South Korea.

Research Associate

Aug, 2011 – May, 2013

Institute of Media Innovation, NTU

Singapore

- Contributing to the implementation of postdoctoral researchers' projects, with a focus on virtual reality. Developed a training kit for evacuation staff using Microsoft Kinect and Immersive CAVE.
- Played a key role in the creation of a software suite enabling interaction between the Nao robot, virtual avatars, and real humans in a tri-party collaborative working space.

Software Engineer

Oct, 2008 – July, 2011

Visual Factory Pvt Ltd

Singapore

- I started as a programmer and advanced to a technical lead role, my work spanned various fields such as 3D graphics, scene rendering, and game design.
- Led the development of a Software Development Kit (SDK) for 3D applications using Open Scene Graph and C++, resembling a Second Life-style game. The software allowed users to have customizable avatars and decorate virtual homes, tailored for the paint company "AkzoNobel."

Software Engineer

May, 2005 – Mar, 2007

IBM Global Services

Bangalore, India

- Developed backend and frontend applications for AT&T telecom bill generation as a Software Engineer, utilizing Java and C++ on the Unix platform.
- Managed extensive database updates on a large scale project, gaining valuable software engineering skills including alpha testing and insights into large-scale project management.

RESEARCH GRANTS

Proposal ID: NRF2018-ITS003-015 (Grant Reward - 253K SGD) 2019

Title: From Virtual Reality to Simulation: User-Centered Design of Dynamic Guidance Systems for transit hubs.

Partners: SEC, TUMCREATE, NTU

Singapore

Proposal ID: L2NICTDF1-2017-1 (Grant Reward - 1 million SGD) 2016

Title: Pedestrian Comfort in High Pedestrian Activity Areas. Partners: SEC, SUTD, NUS, AGENCY, URA, HDB,

LTA

Singapore

TEACHING EXPERIENCE

851-0467-00L: Traffic Modeling to Smart Cities and Digital Democracies ([link](#))

Fall'2023

Computational Social Science

ETH, Zurich

Professional Software Development ([link](#))

Autumn 2021, 2022

Computational Modeling and Simulation

TUM, Munich

Engineering Databases ([link](#))

Fall'2022

Computational Modeling and Simulation

TUM, Munich

ACADEMIC SUPERVISION

Thesis: Evidence Driven Human Centered Design

2021–still

PhD. Researcher at Cornell University

NY, USA

Thesis: "Fine-to-course" Path Planning in Cognitive AI

2020–2021

HONOURS AND AWARDS

- **Awarded Leonhard Obermeyer Center (LOC) Postdoctoral scholarship:** TUM, Munich 2020
- **Best Paper Award, TENCON:** A*Star, Singapore 2018
- **Ranked 8th in LivDet 2015 Fingerprint Liveness Detection Competition:** A*Star, Singapore 2015
- **Ranked 9th out of 53 in Multi-Modal Gesture Recognition, Kaggle:** A*Star, Singapore 2015
- **Awarded certificate of appreciation Singapore Smart nation 2015:** A*Star, Singapore 2015
- **Awarded best fresher and BRAVO award:** IBM, India 2005

REVIEW DUTIES

Journals	Computer Animation & Virtual Worlds, Simulation Modelling Practice and Theory The Visual Computer, Sustainability, Behavioral Sciences, Applied Sciences, Fire, Sensors
Conferences	IEEE VR, AAMAS. AAMAS PC Chair

PUBLICATIONS (SELECTED 10)

- Dubey, R. K., Sánchez Vaquerizo J A., Dailisan D., Helbing D., (UNDER REVISION). Cooperative Adaptable Lanes for Safer Shared Space and Improved Mixed Traffic Flow in intelligent transportation systems. IEEE transactions on intelligent transportation systems.
- Helbing, D., Mahajan, S., Fricker, R. H., Musso, A., Hausladen, C. I., Carissimo, C., ... Dubey, R. K Pournaras, E. (2023). Democracy by Design: Perspectives for digitally assisted, participatory upgrades of society. Journal of Computational Science, 102061.
- Dubey, R. K., Sohn, S. S., Thrash, T., Holscher, C., Kapadia, M., Borrmann, A. (2022). Cognitive path planning with spatial memory distortion. IEEE Transactions on Visualization and Computer Graphics. Advance online publication. doi, 10.
- Dubey, R. K., Sohn, S. S., Abualdenien, J., Thrash, T., Hoelscher, C., Borrmann, A., Kapadia, M. (2021, November). SNAP: successor entropy based incremental subgoal discovery for adaptive navigation. In Proceedings of the 14th ACM SIGGRAPH Conference on Motion, Interaction and Games (pp. 1-11).
- Zhou, H., Enrique, A. M. L., Schinazi, V., Amray, S., Fabian, S., Dubey, R. K., Karjalainen, J., Thrash, T., Dirk, H., Hoelscher, C. (2021). A decentralized adaptive sign system for fire evacuation with human and agent validation. Safety Science.
- Dubey, R. K., Khoo, W. P., Morad, M. G., Hölscher, C., Kapadia, M. (2020). AUTOSIGN: A Multi-Criteria Optimization Approach to Computer Aided Design of Signage Layouts in Complex Buildings. Computers Graphics.
- Dubey, R. K., Thrash, T., Kapadia, M., Hoelscher, C., Schinazi, V. R. (2019). Information Theoretic Model to Simulate Agent-Signage Interaction for Wayfinding. Cognitive Computation, 1-18.
- Dubey, R. K., Sohn, S. S., Hoelscher, C., Kapadia, M. (2019, July). Fusion-Based Wayfinding Prediction Model for Multiple Information Sources. In 2019 22th International Conference on Information Fusion (FUSION) (pp. 1-8). IEEE.
- Dubey, R. K., Sohn, S. S., Thrash, T., Hoelscher, C., Kapadia, M. (2019). Identifying indoor navigation landmarks using a hierarchical multi-criteria decision framework. In Motion, Interaction and Games (pp. 1-11).
- Dubey, R. K., Samuel S Sohn, Christoph Holscher, and Mubbasir Kapadia, “Cognitive agent based simulation model for improving disaster response procedures,” AI + HADR 2019, NeurIPS, Vancouver, CANADA, 11th Dec, 2020.arXiv preprint arXiv:1910.00767, 2019

REFERENCES

- Prof. Dr. Christoph Hoelscher, ETH Zurich choelsch@ethz.ch
- Prof. Dr.-Ing. André Borrmann, TU Munich andre.borrmann@tum.de
- Prof. Dr. Mubbasir Kapadia, Rutgers University, USA mubbasir.kapadia@rutgers.edu