Jayanth Raghothama

Scientist, Manager

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Profile

Experienced scientist and manager, tenured faculty at KTH Royal Institute of Technology, Stockholm, Sweden. Expertise in machine learning and simulation methods. Leading and working on healthcare projects since 2019, for early detection, risk stratification and care improvement, covering Colo Rectal Cancer, Small Cell Lung Cancer, Endometriosis, Mental Health and Wellbeing, and other diseases. Part of initiatives on improving semantic interoperability and developing data infrastructures for Childhood Cancer, using (meta) ontologies and knowledge graphs. Previously worked on urban planning and transportation, agriculture and energy.

Experience

2023–Present **Associate Professor in Healthcare Logistics**, *Department of Biomedical Engineering and Health Systems, KTH Royal Institute of Technology*, Stockholm
Leading research projects on data driven health, developing machine learning and artificial intelligence models for precision medicine, early detection, risk assessment and improvement of care workflows. Projects cover multiple pathologies, and multi-modal data. Projects also include significant work on data harmonization, using ontologies and knowledge graphs. Experience includes supervision of research teams including PhD students and post-doctoral researchers, teaching, raising grants from various funding agencies.

2019–2024 **Vice-Director, KTH Digitalization Platform**, *KTH Royal Institute of Technology*, Stockholm
Co-ordinate projects and initiatives in Digitalization across the University. Responsible for implementing systems for data management and governance, as well as programs for embedding data stewards across research groups. Organized inter-disciplinary workshops covering Digitalization other domains, such as Life Sciences, Cyber Security, Energy and High Performance Computing.

2019–2023 **Assistant Professor in Healthcare Logistics**, *Department of Biomedical Engineering and Health Systems, KTH Royal Institute of Technology*, Stockholm
Lead and participate in research projects on mental health and wellbeing in children and young people, sustainable cities, and multi-omics modeling for Endometriosis.

2017–2018 **Post Doctoral Researcher**, *KTH Royal Institute of Technology*, Stockholm
Research on sustainable cities

2012–2017 **Doktorand (PhD Researcher)**, *KTH Royal Institute of Technology*, Stockholm
Developed ProtoWorld, a distirbuted, interactive simulation platform for urban planning and transportation. The platform integrates SUMO with other traffic simulations, and animates the integrated simulation at run time in Unity3D, providing a high fidelity, interactive platform for experimentation.

2012–2012 **Lead Engineer**, *Mango Games Interactive Pvt. Ltd.*, Bangalore
Lead for a team of engineers developing online games.

2012–2012 **Lead Engineer**, *Edgemetric*, Bangalore
Lead for a team of engineers developing analytics platform for advertising companies

2009–2012 **Research Engineer**, *Center for Study of Science, Technology and Policy*, Bangalore
Research and development of simulations, models and games for policy analysis and design, covering agriculture, defense, urban planning and energy domains. Lead and mentor junior engineers. Organize events and workshops.

2009–2009	**Research Intern**, *Center for Study of Science, Technology and Policy*, Bangalore Work on simulation models for spread of nuclear fallout, and agricultural supply chains.
2008–2009	**Teaching Assistant**, *International Institute of Information Technology*, Bangalore Teaching assistant for the Mathematical Foundations of Computing Course

Education

2012–2017	**PhD**, *KTH Royal Institute of Technology*, Stockholm Thesis Title: *Integrating Computational and Participatory Simulations for Design in Complex Systems*
2007–2009	**Master of Technology in Information Technology**, *International Institute of Information Technology*, Bangalore
2003–2007	**Bachelor of Engineering in Computer Science**, *Visvesvaraya Technological University*, Bangalore

Doctoral Thesis

Title	*Integrating Computational and Participatory Simulations for Design in Complex Systems*
Supervisors	Prof. Sebastiaan Meijer and Assoc. Prof. Gunnar Flötteröd

Grants

Horizon Europe, 2024	Co-PI, Demonstrating transformative solutions to empower climate resilience towards improved public health status in the EU boreal region (AURORA), 7 Million EUR
Digital Futures, 2024	PI, AI Based Detection of Colo Rectal Cancer in Primary Care, 1 Million SEK
Digital Futures, 2023	Co-PI, Data Driven Improvement of Workflows at Karolinska University Hospital, 1 Million SEK
Vinnova, Vinter, 2022	PI, Vidareutvecklat ontologiverktyg som bas för nationell metadatakatalog, 700k SEK
Horizon2020, 2021	Co-PI, FEMaLe, Finding Endometriosis using Machine Learning, 6 Million EUR
Lighthouse, 2021	Co-PI, Gamification for Waterbusses, 550k SEK
TRENoP, 2019	PI, Health Accessibility in a Smart City, 1 Million SEK

Supervision

PhD Students	○ Arsineh Boodaghian Asl, Co-Supervisor ○ Luca Marzano, Co-Supervisor ○ Merja Hietanen, Co-Supervisor ○ Mikaela Hellstrand, Co-Supervisor
Masters Theses	○ 12+ Students
Bachelor's Theses	○ 12+ Students

Leadership

Courses	○ Leadership for Associate Professors, internal program at KTH ○ Partners in Learning, course on leadership for tenure track faculty at KTH

Reviewing	○ Journal of Simulation & Gaming; Editorial Review Board, International Journal of Gaming and Computer-Mediated Simulations (IJGCMS); Editorial Review Board, International Journal of Game-Based Learning (IJGBL); British Journal of Education Technology (BJET); Journal of Biomedical Informatics		
Chair	○ Gaming, Winter Simulation Conference, 2018 - 2023		
	○ Gaming in Supply Chains and Logistics, International Simulation And Gaming Association Conference		

Technical Skills

Programming	Python	Machine Learning	Keras, Scikit-Learn
GIS	QGIS, PostGIS	Simulation	HLA, AnyLogic, SUMO
Databases	PostgreSQL, Neo4J	Libraries	RabbitMQ, Spark

Awards and Prizes

○ Winner, Commutathon. Commutathon was a hackathon organized by Sverige Radio, Trafiklab and OpenLab on developing innovative smart city solutions using open data. My team mates Vinutha Magal Shreenath, Michael van den Berg, Miguel Ramos Carretero and I won this competition, judged by a jury of experts from Stockholm City, OpenLab, Trafiklab and Sverige Radio.

○ First Runner Up, Google Product Prodigy 2009. Product Prodigy is a product design competition held by Google across India. The Big Kahuna, a map reduce framework implemented over browsers won second place in the 2009 edition of the competition.

○ Sir M Vishveswariah Gold Medal for Best Male Student, July 2009, International Institute of Information Technology - Bangalore.

Teaching

○ Applied Machine Learning and Data Mining, CM1001 and CM2007, Course Responsible and Examiner

○ Teacher HM102V, CD1001, ML2302, CM2001, CM2010: Modules on Simulation, Ethics and Informatics

Publications

Journal Articles

[1] A. Boodaghian Asl, **J. Raghothama**, A. Darwich, and S. Meijer, "A hybrid modeling approach to simulate complex systems and classify behaviors," *Network Modeling Analysis in Health Informatics and Bioinformatics*, vol. 13, no. 1, p. 9, Mar. 18, 2024.

[2] M. Hellstrand, M. Kornevs, **J. Raghothama**, and S. Meijer, "Tensions between real-world practices and the digitalization paradigm for data-driven services in eldercare: Observations from an ethnographic study in sweden," *BMC Geriatrics*, vol. 24, no. 1, p. 98, Jan. 25, 2024.

[3] A. S. Darwich, A.-M. Boström, S. Guidetti, **J. Raghothama**, and S. Meijer, "Investigating the connections between delivery of care, reablement, workload, and organizational factors in home care services: Mixed methods study," *JMIR Human Factors*, vol. 10, e42283, Jun. 30, 2023.

[4] L. Marzano, A. S. Darwich, S. Tendler, A. Dan, R. Lewensohn, L. De Petris, **J. Raghothama**, and S. Meijer, "A novel analytical framework for risk stratification of real-world data using machine learning: A small cell lung cancer study," *Clinical and Translational Science*, vol. 15, no. 10, pp. 2437–2447, 2022.

[5] **J. Raghothama**, J. B. Hauge, and S. Meijer, "Curating player experience through simulations in city games," *Urban Planning*, vol. 7, no. 2, Jun. 3, 2022, Number: 2.

[6] **J. Raghothama** and S. Meijer, "Rigor in gaming for design: Conditions for transfer between game and reality," *Simulation and Gaming*, vol. 49, no. 3, pp. 246–262, 2018.

[7] S. Meijer, **J. Raghothama**, and R. King, "Disentangling the complexity of india's agricultural sector," *APSTRACT: Applied Studies In Agribusiness And Commerce*, vol. 6, no. 1, pp. 35–43, 2012.

Conference Proceedings

[8] M. N. Abourraja, L. Marzano, **J. Raghothama**, A. B. Asl, A. S. Darwich, S. Meijer, S. Lethvall, and N. Falk, "A data-driven discrete event simulation model to improve emergency department logistics," in *2022 Winter Simulation Conference (WSC)*, ISSN: 1558-4305, Dec. 2022, pp. 748–759.

[9] S. Meijer, K. Olejniczak, and **J. Raghothama**, "Public policy and engineering systems synergy," in *Handbook of Engineering Systems Design*, A. Maier, J. Oehmen, and P. E. Vermaas, Eds., Cham: Springer International Publishing, 2022, pp. 1–24.

[10] A. B. Asl, **J. Raghothama**, A. Darwich, and S. Meijer, "Simulation and model validation for mental health factors using a multi-methodology hybrid approach," in *2021 Winter Simulation Conference (WSC)*, ISSN: 1558-4305, Dec. 2021, pp. 1–12.

[11] A. B. Asl, **J. Raghothama**, A. Darwich, and S. Meijer, "Using PageRank and social network analysis to specify mental health factors," in *Proceedings of the Design Society*, Publisher: Cambridge University Press, vol. 1, Aug. 2021, pp. 3379–3388.

[12] B. Roungas, **J. Raghothama**, M. Baena, O. G.-C. Ros, R. Alcolea, and R. Herranz, "Technology adoption in air traffic management: A combination of agent-based modeling with behavioral economics," in *2021 Winter Simulation Conference (WSC)*, ISSN: 1558-4305, Dec. 2021, pp. 1–12.

[13] **J. Raghothama**, H. Hanchi, and S. Meijer, "Hybrid, composable approach to simulations in healthcare operations and management," in *2017 Winter Simulation Conference (WSC)*, ISSN: 1558-4305, Dec. 2017, pp. 2857–2868.

[14] **J. Raghothama**, E. Moustaid, V. Magal Shreenath, and S. Meijer, "Bridging borders: Integrating data analytics, modeling, simulation, and gaming for interdisciplinary assessment of health aspects in city networks," in *City Networks: Collaboration and Planning for Health and Sustainability*, A. Karakitsiou, A. Migdalas, S. T. Rassia, and P. M. Pardalos, Eds., Cham: Springer International Publishing, 2017, pp. 137–155.

[15] **J. Raghothama**, V. M. Shreenath, and S. Meijer, "Analytics on public transport delays with spatial big data," in *Proceedings of the 5th ACM SIGSPATIAL International Workshop on Analytics for Big Geospatial Data*, ser. BigSpatial '16, New York, NY, USA: ACM, 2016, pp. 28–33.

[16] J. B. Hauge, M. R. Carretero, J. Kodjabachian, S. Meijer, **J. Raghothama**, and B. Duqueroie, "ProtoWorld–a simulation based gaming environment to model and plan urban mobility," in *International Conference on Games and Learning Alliance*, Springer International Publishing, 2015, pp. 393–400.

[17] **J. Raghothama**, M. Azhari, M. R. Carretero, and S. Meijer, "Architectures for distributed, interactive and integrated traffic simulations," in *Forthcoming*, 2015.

[18] **J. Raghothama** and S. Meijer, "Distributed, integrated and interactive traffic simulations," in *Proceedings of the 2015 Winter Simulation Conference*, ser. WSC '15, Piscataway, NJ, USA: IEEE Press, 2015, pp. 1693–1704.

[19] **J. Raghothama** and S. Meijer, "Gaming, urban planning and transportation design process," in *Planning Support Systems and Smart Cities*, S. Geertman, J. Ferreira Jr., R. Goodspeed, and J. Stillwell, Eds., Cham: Springer International Publishing, 2015, pp. 297–312.

[20] **J. Raghothama** and S. Meijer, "What do policy makers talk about when talking about simulations?" In *Proceedings of the 46th International Simulation and Gaming Association Conference*, Kyoto, Japan, 2015.

[21] V. M. Shreenath, M. Kornevs, **J. Raghothama**, and S. Meijer, "A feasibility study for gamification in transport maintenance: Requirements to implement gamification in heterogeneous organizations," in *Games and Virtual Worlds for Serious Applications (VS-Games), 2015 7th International Conference on*, IEEE, 2015, pp. 1–7.

[22] **J. Raghothama** and S. A. Meijer, "A review of gaming simulation in transportation," in *Frontiers in gaming simulation*, Springer International Publishing, 2014, pp. 237–244.

[23] S. Meijer, **J. Raghothama**, R. King, and A. Verbraeck, "Supply chain gaming simulation for indian food supply chains: A review of the need for and introduction of a new design," in *9th Wageningen International Conference on Chain and Network Management. Hof van Wageningen, Wageningen. May 26-28 2010*, 2010.

Presentations

- WinterSim 2017, Las Vegas, USA. "Hybrid, Composable Approach to Simulations in Health Care Operations and Management"
- ISAGA Summer School 2017, Stockholm, Sweden. "Fidelity, Validity and Realism"
- WinterSim 2015, Los Angeles, USA. "Distributed, Integrated and Interactive Traffic Simulations"
- ISAGA 2015, Kyoto, Japan "What do policy makers talk about when talking about simulations?"
- CUPUM 2015, Boston, USA "Gaming, Urban Planning and Transportation Design Process."
- Plenary interactive session of The Urban Game at the Metrex – The European network of Metropolitan regions at Milan Expo, 2015.
- Interactive session of The Urban Game with planners, Clarion Hotel, Stockholm, 2015.
- Games for Health, Utrecht, 2015. "Design Dimensions for Future Complex Systems: An integrated perspective towards health care".
- Nationella Konferensen I Transportforskning, Goteborg, Sweden, 2014 "Playing with Transport Policy Problems: An Agenda for Tools and Methodology."
- Interactive session for COMPLEX, of the Democracy game, Sigtuna, Sweden, 2014, "Stakeholder involvement in gaming and model reflection."
- DataSIM 2013, Hasselt, Belgium "Framework for Integrated Simulations and Gaming."
- ISAGA 2013, Stockholm, Sweden. "A Review of Gaming Simulation in Transportation."
- Artificial Economics, The Hague, 2011. "Indian Food Supply Chains: A Game and model to study economic behavior."
- Plenary interactive session "City Game" at Imagining Infrastructures, an international workshop organized by CSTEP, July 2011.
- Interactive Training session for first responders and emergency management personnel, Administrative Training Institute, Mysore, 2011.
- Interactive session "Playing a City Building Game" at the international workshop Research in a development context: Putting knowledge into practice, organized by Swissnex India and CSTEP, Bangalore, December, 2010.
- Interactive session "Aatakkuntu, Lekkakkuntu - Simulation of Participation and Planning in the Evolution of Bengaluru", at Mobilicity, an un-conference organized by CiSTUP, Indian Institute of Science and Praja, November, 2009.
- Role of Modelling, Simulation and Gaming for Policy Analysis, workshop organized by CSTEP and TUDelft, Bangalore, July 2009. "Mango Mandi - Semi perishable agricultural supply chains."

Other Scientific Work

- The Urban Game session at Reglab conference, 2015.

- ○ ProtoWorld showcase at Smart City Expo in Barcelona, November 2015.
- ○ ProtoWorld showcase at London's City Hall, for members of the Smart London Board.
- ○ ProtoWorld showcase at EIT Digital Stockholm Results Day.
- ○ ProtoWorld showcase at EIT Digital Paris Results Day.
- ○ ProtoWorld showcase at Innovative City – Exhibitions and Conferences in Nice, 2015.
- ○ ProtoWorld showcase at Tag Der Logistik, 2016.
- ○ ProtoWorld workshop at Games and Learning Alliance Conference 2015, Rome.
- ○ Member of the Organizing Committee of ISAGA 2013.
- ○ Session Chair at ISAGA 2013.
- ○ City Game session at India Urban Conference, organized by India Water Portal and Yale University, Mysore, India 2011.
- ○ Member of Organizing Committee, Imagining Infrastructures, an international workshop organized by NGIL, CSTEP, Bangalore, 2011.
- ○ Member of the Organizing Committee of NGInfra 2009: International Conference on Infrastructure Systems.
- ○ Member of Organizing Committee, Role of Modelling, Simulation and Gaming for Policy Analysis, workshop jointly organized by CSTEP and TUDelft, 2009.