

RANJITH K. SOMAN

PhD Candidate, Centre for Systems Engineering and Innovation, Imperial College London, SW72AZ
ranjithks17@imperial.ac.uk | +447721826099

EDUCATION

PhD in Civil and Environmental Engineering, March 2017-July 2020 (Ongoing)

Imperial College London, United Kingdom, Thesis: “*Codifying information flow in construction as a manufacturing process*”, Focus: Automating look ahead planning of modular offsite construction using linked data and reinforcement learning, modelling constraints and information flow in construction and case studies with leading projects to understand challenges of codification of information flow.

PhD Enrichment Scholar, September 2018-March 2019

The Alan Turing Institute, United Kingdom, Focus: Using machine learning algorithms to optimize construction planning and execution.

Research MSc in Civil Engineering (CGPA 8.8), July 2013-May 2016

Indian Institute of Technology (IIT) Madras, India, Thesis: “*Automated monitoring of launching girder operations using wireless sensor network*” Focus: Construction planning and control, lean construction, construction project modelling, and smart buildings and automation.

BTech in Civil Engineering (First class with honors, CGPA 8.43), August 2009-June 2013

University of Calicut, India, Focus: Structural engineering, fluid mechanics and water resources engineering, geotechnical engineering, transportation engineering, and environmental engineering.

PROFESSIONAL ROLES

Research Associate, July-December 2016

Building Automation Lab, Indian Institute of Technology (IIT) Madras, Responsible for the development of the virtual model of the building automation system for self-assembly of columns and beams, designing the sensor configurations and control system and preparing the specifications for procurement of necessary hardware.

Trainee site engineer, June-July 2011

Consolidated Construction Consortium Ltd. Responsible for planning, estimating and forecasting material use, raising material requisition and bar bending schedules, recording bore pile logs, compiling daily progress report.

RESEARCH FUNDING

1. Centre for Systems Engineering and Innovation Small Project “*Upgrading 3D Move for collaborative visualization*” 2017: Rs 6,20,000, March 2019 –September 2019
2. The Alan Turing Institute PhD enrichment scholarship, Rs2,86,600, October 2018 – March 2019.
3. Named researcher in “*Building resilient infrastructure through metro development*” EPSRC-GCRF Community Building Fund (internal call) to work with University of Cambridge and Indian Institute of Technology Madras: Rs 9,24,700, November 2017-March 2018.
4. Centre for Systems Engineering and Innovation Small Project “*Augmented visualization for improved construction progress monitoring*” 2017: Rs 8,70,000, May 2017 –September 2017
5. Skempton scholarship, Imperial College London: Rs 66,11,500, February 2017 – July 2020.
6. Bentley Systems co-sponsorship, Imperial College London: Rs 73,97,500, February 2017 – February 2020.
7. Post-graduate scholarship, Ministry of Human Resource Development, India: Rs,5,08,500, Aug 2013-May 2016.

PUBLICATIONS

1. **Soman, R.K.**, & Whyte, J.K. (2020), Codification challenges for data science in construction, *ASCE Journal of construction engineering and management* (In Press)
2. **Soman, R.K.** (2019), Linked-data based dynamic constraint solving framework to support look-ahead-planning in construction, *36th International Council for Research and Innovation in Building and Construction W78 Conference on ICT in Design, Construction and Management in Architecture, Engineering, Construction and Operations (AECO)*, Newcastle, United Kingdom.
3. **Soman, R.K.** (2019). Modelling construction scheduling constraints using Shapes Constraint Language (SHACL), *European Conference on Computing in Construction (EC³ 2019)*. Crete, Greece.
4. Balasubrahmani, M., **Soman, R.K.**, Whyte, J.K., Mahalingam, A., (2019). Temporality, innovation and megaproject-to-megaproject learning across continents in the case of Crossrail and Nagpur Metro. *35th European Group for Organizational Studies (EGOS) Colloquium*. Edinburgh, UK.
5. Senthilvel, M., **Soman, R.K.**, Mahalingam, A., Whyte, J.K., Raphael, B., Brilakis, I., & Varghese, K. (2018). Towards digital delivery of metro-rail projects in India. *7th World Construction Symposium 2018: Built Asset Sustainability: Rethinking Design, Construction and Operations*. Colombo, Sri Lanka.
6. **Soman, R.K.**, Raphael, B., & Varghese, K. (2017). A System Identification Methodology to monitor construction activities using structural responses. *Automation in Construction*, 75, 79–90.
7. **Soman, R.K.**, Birch, D., & Whyte, J.K. (2017). Framework for shared visualization and real-time information flow to the construction site. *24th European Group for Intelligent Computing in Engineering (EG-ICE) International Workshop on Intelligent Computing in Engineering*. Nottingham, UK.
8. **Soman, R.K.**, & Whyte, J.K. (2017). A framework for cloud-based virtual and augmented reality using real-time information for construction progress monitoring. *Lean & Computing in Construction Congress (LC3)*. Heraklion, Greece.
9. Senthilvel, M., **Soman, R.K.**, & Varghese, K. (2017). Comparison of handheld devices for 3D reconstruction in construction. *34th International Symposium on Automation and Robotics in Construction (ISARC)*. Taipei, Taiwan.
10. **Soman, R.K.**, Raphael, B., & Varghese, K. (2015). Sensor placement to monitor launching girder operations in segmental construction. *32nd International Symposium on Automation and Robotics in Construction (ISARC)*. Oulu, Finland.

INDUSTRY ENGAGEMENT

Industry Workshops / Expert Input

- Expert chair: *What is next in 4D BIM*, BIM4Construction working group, London, September 2019;
- Co-organiser: *Digital metro rail construction: UK-India collaborative workshop*, IIT Madras, March 2018;
- Expert panel member, *Wearables in construction*, Construction Mobile IT (COMIT) conference, London, May 2017;
- Participant in Centre for Digital Built Britain (CDBB) workshops: *AR and VR for Digital Built Britain*, October 2018 and *Network scoping workshop*, April 2018; and
- 'Process innovation forum' innovation workshops; 1) *Future of wearables*, October 2017; *drones*, September 2017; 3) *VR and AR in built environment*, September 2017.

Research Presentation to Industry

1. "*Building Information Modelling : Why and What to keep in Mind?*", Larsen and Toubro Construction, Chennai, October 2019
2. "*Linked-data based dynamic constraint solving framework for effective look-ahead-planning in construction*", Bentley Year in Infrastructure, Singapore , 2019

3. *"Using linked data to support automation of look ahead planning in construction as a manufacturing process"*, Centre for Systems Engineering and Innovation (CSEI) Industry showcase event 2018, Imperial College London, UK, September 2018 (best poster award).
4. *"Using linked data to support automation of look ahead planning in construction as a manufacturing process"*, Imperial-BCA DfMA and IDD Leadership 2018, Imperial College London, UK, November 2018.
5. Presentation on *"Codifying Information Flow in Modular Offsite Construction"*, Bentley year in infrastructure 2018, London, UK, October 2018.
6. Three Presentations on *"Codifying Information Flow in construction as manufacturing process"*, Multiplex: June 2018, Tideway: May 2018, Laing O' Rourke Explore: April 2018

Hackathon Participation

7. First Place, Linked data in architecture and construction 2019 Hackathon, Lisbon, Portugal 18/07/2019
8. AEC/FM Hackathon-ISARC 2018, Berlin, Germany, 20/07/2017
9. HS2 Hackathon, Catapult, Milton Keynes, UK, 09/12/2017

TEACHING EXPERIENCE

"Virtual Reality", University of Reading, December 2018;

"BIM for design and construction" – 3 classes as part of Innovation in Civil Engineering MSc module, Imperial College London, November 2018;

"Lean and information technology" as part of Lean construction, Indian Institute of Technology Madras, December 2016.

ADVANCED COURSES TAKEN

"Applied machine learning boot camp", Google UK, Imperial College London,, September 2019

"Computing in construction summer school", European Council for Computing in Construction, Senigallia, Italy July 2019

"Linked data in architecture and construction summer school", LDAC Working committee, Lisbon June 2019

"Research software engineering", Alan Turing Institute, October 2018-January 2018;

"Ground zero machine learning", ML Society, Imperial College London, February 2018-April 2018;

"BIM summer school", Aalto University, June 2018;

"Active bystander training", Imperial College London, September 2018;

"Virtual Reality" (VR) summer course, Indian Institute of Technology Madras, July 2015.
