

Dr Gökçen YILMAZ PhD, MSc, BSc

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VISION

My principal research interests lie in software engineering, digital transformation, capability and maturity assessment models, business process modelling and improvement, and their applications to diverse sectors, i.e., manufacturing, construction, transport, and healthcare. My research vision for sustainable digitalisation is to develop methodologies to help practitioners develop low-cost customisable digital solutions which improve interoperability across the information value chain and reusability in software components. I also have significant experience in teaching and supervising students at the undergraduate and postgraduate levels. I have designed courses, developed content, and delivered various modules on software engineering, software quality assurance, algorithms and programming, object-oriented programming, digitalisation and information management and operations management.

EDUCATION

2012-2017	PhD in Information Systems Middle East Technical University (METU), Turkey Thesis title: BIM-CAREM: A Reference Model for Building Information Modelling Capability Assessment Supervisors: Assist. Prof Aslı Akçamete Güngör, Prof Onur Demirörs Courses taken: Social Network Analysis, Information Security Management, System Development with Abstract Design, Qualitative Research, Introduction to Software Testing, Research Methods and Statistics for Cognitive Science. CGPA:3.75/4.00
2016-2017	Certification on Teaching in Higher Education Middle East Technical University (METU), Turkey
2012	Certification on Practical Experiments on Software Engineering Free University of Bozen, Italy
2009-2012	MSc in Information Systems Middle East Technical University (METU), Turkey Thesis title: An Automated Defect Detection Approach for Cosmic Functional Size Measurement Method; Supervisor: Prof Onur Demirörs Courses taken: Database Concepts and Applications, Computer Networking for Information Systems, Introduction to Software Engineering, Object Oriented Analysis and Design, Software Project Management, Software Quality Management CGPA:3.13/4.00
2003-2008	BSc in Industrial and Systems Engineering Yeditepe University, Turkey Thesis title: Simulating Supply Chain of a Manufacturing Company using Stella CGPA:3.20/4.00

ACADEMIC EMPLOYMENT

2020-To date **Research Associate in Low-Cost Automation Systems**

Distributed Information and Automation Laboratory, Institute for Manufacturing, University of Cambridge

College Research Associate, Lucy Cavendish College, University of Cambridge

Digital Construction on a Shoestring (Centre for Digital Built Britain and EPSRC funded; PI: Prof. Duncan McFarlane)

- Led the project by working with 70+ SMEs, large businesses, early career researchers (5 postdoctoral researchers, 1 PhD and 1 MPhil student) and senior academics to identify top priority low-cost digital solutions for operational efficiency of organisations and their business processes.
- Led the functional specification, design, development, and deployment of digital solutions (hardware and software) to companies in construction, manufacturing and healthcare sectors.
- Developed a digital impact assessment methodology for quantifying business benefits and improvements in the digital capability of organisations.
- Defined user personas and flows; developed the prototype of the Shoestring digital solution configuration portal.
- Working in close partnership with Centre for Digital Built Britain, Construction Innovation Hub, Building Research Establishment and Manufacturing Technology Centre to disseminate research findings to influence businesses and government policies.

Digital Hospitals (Cambridge University Hospitals funded; PI: Prof. Ajith Kumar Parlikad)

- Working within a team of 13 early career researchers (6 postdoctoral researchers and 7 PhD students) to develop a digital twin for Cambridge University Hospitals (Addenbrookes) by leveraging data science and process modelling for improving hospital performance.
- Contributing to the development of a set of low-cost digital solutions (hardware and software) to demonstrate their benefits and inform future developments in the hospital.
- Leading the work on engaging with the users and academics to identify areas where digital solutions can improve process efficiencies and how the digital twin can be designed to enable efficient human-computer interaction and decision support.

Centre for Smart Infrastructure and Construction (EPSRC and Innovate UK funded; PI: Dr Jennifer Schooling)

- Leading the digital capability and maturity assessment of 10+ infrastructure authorities in the UK (e.g., Network Rail, High Speed 1, Transport for London, Transport for Scotland etc.) by engaging with software practitioners, policymakers, engineers, and academics.
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2018-2021	<p>Assistant Professor in Computer Engineering, Pamukkale University</p> <ul style="list-style-type: none"> Developed teaching content, syllabus, and learning outcomes and delivered lectures on Software engineering, Software quality assurance, Algorithms and programming, and Object-oriented programming to undergraduate students Designed and delivered the course's theoretical and practical laboratory sessions, set assignments and marking criteria and provided feedback <p>Researcher Associate in Computer Engineering, Pamukkale University Anomaly Detection in Mobile Communication Infrastructure Systems (funded by The Scientific and Technological Research Council of Türkiye; PI: Prof Serdar İplikçi) Led the development of a user interface to visualise the anomaly detection results gathered through the data analysis algorithms</p>
2009-2017	<p>Research Assistant, Middle East Technical University</p> <p>I was involved in the following research and development projects:</p> <ul style="list-style-type: none"> Modelling process flow of renovation and maintenance projects of the METU buildings. BIM Capability Assessment of the underground project of the Gaziantep Metropolitan Municipality. Simulated a GIS-based dynamic traffic junction control system for Balıkesir Municipality. Led the software benchmarking and development of a functional size measurement tool as part of the project funded by The Scientific and Technological Research Council of Türkiye
2014-2015	<p>Visiting Researcher at Distributed Information and Automation Laboratory, Institute for Manufacturing, University of Cambridge</p> <p>Information futureproofing for large-scale infrastructure funded by the Centre for Smart Infrastructure and Construction through EPSRC and Innovate UK. Collaborated with Prof Duncan McFarlane, Prof Ajith Kumar Parlikad, Dr Tariq Masood and Dr Jennifer Schooling</p> <p>Warehouse data management. Collaborated with Prof Duncan McFarlane, Dr Philip Woodall, Dr Vaggelis Giannikas, and Wenrong Lu</p>

TEACHING EXPERIENCE

2020- To date	<p>Principles in Communications, Part II course in the Department of Computer Science and Technology, the University of Cambridge, led by Professor Jon Crowcroft. Responsible for supervising undergraduate students about networks and routing, flow control and resource optimisation, packet scheduling, managing traffic and system structures and summary.</p> <p>Data and Modelling, MPhil in Industrial Systems, Manufacture and Management (ISMM) course in the Department of Engineering, Institute for Manufacturing, the University of Cambridge, Responsible for hands on case</p>
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	studies with postgraduate students about regression analysis based on manufacturing data.
Nov-Dec 2021	Invited Lecturer at Kyung Hee University to deliver part of a module (4 sessions) on improving BIM capabilities in the construction industry, information futureproofing for infrastructure assets, mobile augmented reality service for BIM, and digital construction on a shoestring. Utilised research-informed teaching through showcasing my relevant research projects
2018-2021	Assistant Professor in Computer Engineering at Pamukkale University. Taught modules on Software Engineering, Software Quality Assurance, Algorithms and Programming and Object-oriented Programming . Responsible for designing the course and learning outcomes, developing syllabus and course content, delivering lectures and practical laboratory sessions, setting assignments, and providing feedback
2009-2018	Teaching Assistant at Middle East Technical University. Responsible for supporting the courses on Introduction to Software Testing, Personal Software Process, Software Requirements Engineering, Introduction to Information Technologies and Applications.

STUDENT SUPERVISION and MENTORING

PhD	University of Cambridge. I am mentoring 7 PhD students researching on information systems, information quality management, supply chain management, logistics and asset management through my involvement in several research projects described earlier.
Postgraduate	University of Cambridge. I supervised 1 student for MPhil in Industrial Systems, Manufacturing and Management who researched, developed and deployed a low-cost digital solution for off-site construction and manufacturing SME who manufactures sustainable construction materials. A journal paper is currently in preparation for the supervised project.
Undergraduate	Pamukkale University. I have supervised fifteen undergraduate students in software testing, serious games and image processing for smart home applications.

GRANTS and SPONSORED PROJECTS

Duration	Title	Funder	Value	Role	Contribution
2014-15	Research Fellowship Program	The Scientific and Technological Research Council of Türkiye	£15,000	Lead	Preparing the application, leading and conducting the research (100%)
2014-16	R&D Innovation Program	Ministry of Science, Industry and Technology of Türkiye	£110,000		
2013-14	Entrepreneurship Multi-Phase Program		£45,000		
Total value of attributed funding			£170,000		

Under Review and In Preparation Grant Proposals

Title/Research Area	Potential Funder	Role	Contribution
Matching the relevant technology providers to SMEs based on their digital needs	UKRI/InterAct	Research Co-investigator	Initiating and developing the research idea, Preparing the application.
Developing a low-cost emission monitoring solution for water supplies	Anglian Water		
Integrating their digital solutions with the ones in sub-contractors	Costain		
Automating the asset inspection data capturing and visualising the inspection quality	Network Rail R&D funding		

PUBLICATIONS

My Google Scholar h-index is 5 and i-10 index is 2.

Journal Papers

1. Um, J., Park, J., Park S., **Yilmaz, G.** (2022) A Low-cost Mobile-Edge-Cloud based Augmented Reality Service Platform for Building Information Modelling. *Automation in Construction* (**Accepted**).
2. **Yilmaz, G.**, Akcamete, A., Demirors, O. (2019) A Reference Model for BIM Capability Assessments. *Automation in Construction*. <https://doi.org/10.1016/j.autcon.2018.10.022>, p 245-268
3. **Yilmaz, G.**, Salter, L., McFarlane, D., Schönfuß, B. A Catalogue of Low-cost Digital Construction Solution Areas Enabling Digitalisation in Construction (under review in *Automation in Construction*).
4. **Yilmaz, G.**, Akcamete, A., Demirors O. Assessing the BIM Capabilities of AEC/FM Processes Through BIM-CAREM: Multiple Case Studies (under review in *Computers in Industry*)

Journal Papers in Preparation

5. **Yilmaz, G.**, Kaiser, J., Hawkrigde, G., Salter, E., McFarlane D., Digital Impact Assessment for Low-cost Digital Construction Solutions Developed and Deployed in Small and Medium-sized Construction Enterprises, in preparation for publication in *Automation in Construction* in December 2022.
6. **Yilmaz, G.**, Qurban, K., Kaiser, J., McFarlane, D., Understanding the Effectiveness of Shoestring from Practitioners' Point of View Through Inventory Tracking Tool Development for an Off-Site Construction Company, in preparation for publication in *Computers in Industry* December 2022.
7. Mukherjee, A., **Yilmaz, G.**, Hawkrigde, G., Salter, E., MacFarlane, D., Testing Framework for Low-cost (Shoestring) Industrial Digital Solutions, in preparation for publication in *Computers in Industry* in December 2022.

8. Sasidharan, M., **Yilmaz, G.**, Parlikad, A. P., and Schooling, J. A., Capability Assessment Model for Bridge Management Practices of Infrastructure Authorities, in preparation for publication in Transportation Part A: Policy and Practice January 2023.
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Book Chapters

9. **Yilmaz, G.**, Akcamete, A and Demirors, O, “An Assessment of BIM-CAREM against the selected BIM Capability Assessment Models” Advances in Informatics and Computing in Civil and Construction Engineering, https://doi.org/10.1007/978-3-030-00220-6_46, p 387-395, 2018
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Conference Proceedings (peer-reviewed)

10. **Yilmaz, G.**, Mukherjee, A., Macias, J. An Impact Assessment Model for Low Cost (Shoestring) Digitization in Small Construction Organisations. CIB World Building Congress, Melbourne, Australia, 2022.
11. Kaiser, J., Hawkrigde, G., **Yilmaz, G.**, McFarlane, D. A Low-cost Integration Approach for Distributed Manufacturing Information Systems, IEEE 5th Advanced Information Management, Communicates, Electronic and Automation Control Conference (IMCEC), 2022.
12. **Yilmaz, G.** and Akcamete, A. Identifying Requirements for BIM Adoption in the Case of Maintenance and Renovation Projects of a University, 5th International Project and Construction Management Conference, North Cyprus, 16-18 November 2018.
13. **Yilmaz, G.**, Akcamete, A. Demirors, O. Implementation and Comparison of the Two BIM Capability Assessment Models Through Case Studies. Advances in Informatics and Computing in Civil and Construction Engineering (35th CIB W78), Chicago, 1-3 October 2018.
14. **Yilmaz, G.**, Akcamete, A. Demirors, O. Adapting SPICE for Development of a Reference Model for Building Information Modelling-BIM-CAREM. Software Process Improvement and Capability Determination (SPICE), Thessaloniki, 9-10 October 2018.
15. **Yilmaz, G.** Akcamete, A. Demirors, O. A Review on Capability and Maturity Models of Building Information Modelling. Lean and Computing in Construction Congress (LC3), Crete, 4-10 July 2017.
16. Masood, T., **Yilmaz, G.**, McFarlane, D., Parlikad, A.K. Long-term data preservation and access: infrastructure assets perspective. Our Digital Future - Multidisciplinary Perspectives on Long Term Data Preservation and Access, 15-16 March 2016.
17. Masood, T., **Yilmaz, G.**, McFarlane, D., Parlikad, A.K., Harwood, K. Dunn, R. Information future-proofing assessment for infrastructure assets. Proceedings of International Conference of Smart Infrastructure & Construction, Cambridge, 27-29 June 2016.
18. **Yilmaz, G.**, Masood, T., McFarlane, D. Identifying and validating hazards in support of information futureproofing – case study of a building. IET/IAM Conference on Asset Management, London, 25-26 November 2015.
19. Woodall, P., **Yilmaz, G.**, Giannikas, V., Lu, W., McFarlane, D. New directions for warehousing data management research: Extensions to an existing review, IEEE 13th International Conference on Industrial Informatics (INDIN), pg. 610-613, 2015.
20. Ertugrul, M. **Yilmaz, G.**, Salmanoglu, M., Demirors, O. The Effect of Highlighting Error Categories in FSM Training on the Accuracy of Measurement. International Workshop on

Software Measurement and International Conference on Software Process and Product Measurement, 2014.

21. **Yilmaz, G.**, Tunalilar, S., Demirors, O. Towards the Development of a Defect Detection Tool for COSMIC Functional Size Measurement. 23rd International Workshop on Software Measurement and International Conference on Software Process and Product Measurement, Ankara, 23-26 October 2013.
22. Rashid A., Riaz Z., Sayin E. R., Qureshi H. A., **Yilmaz, G.**, Hu-Ping, P. Strategic e-Commerce Model Driven-Architecture for e-Learning: TQM e-ERP Perspective. Proceedings of PICMET 11: Technology Management in The Energy-Smartworld (PICMET), 2011
23. **Yilmaz, G.**, Ungan, E., Demirors, O. The Effect of the Quality of Software Requirements Document on the Functional Size Measurements. UKSMA, London, 2011.

INVITED KEYNOTES and TALKS

- Digital Construction on a Shoestring, UK Construction Week, London, UK, (2022).
- Development and deployment of job tracking and change management solutions for construction SMEs, Construction Innovation Hub, Cambridge, UK, (2022).
- Digitalisation priorities of on-site construction SMEs, Institute for Manufacturing, Cambridge, UK, (2022).
- Digitalisation priorities of suppliers and off-site construction SMEs, Centre for Digital Built Britain, Cambridge, UK, (2021).
- Identifying hazards in support of information futureproofing - case study of a building, Institute for Asset Management, London, UK, (2015).

PROFESSIONAL EMPLOYMENT

2013- To date	Co-Founder , Gökçağ Yazılım, METU Techno Park, Ankara Software development of an Android-based NFC mobile payment system and smart campus application (product sold to METU Technopark management organisation), learnt about lean start-up and business development.
2008-2009	Production Planning Engineer at Amec Electronics , Istanbul Developed production plans and tracking of resources

SCHOLARSHIPS and AWARDS

2018	Best PhD Thesis in the Department of Information Systems , METU METU Prof Mustafa N. Parlar Education and Research Foundation
2003-2008	Full Scholarship for BSc Education, The Council of Higher Education

ACADEMIC RESPONSIBILITIES and OUTREACH

- Reviewer for Journals of Automation in Construction, ICE Infrastructure Asset Management
 - Deep Learning Fundamentals Certificate, NVIDIA Deep Learning Institute at Graduate School of Informatics, METU
 - Certified COSMIC functional size measurer by the COSMIC organisation, UK and Canada
 - Included in the Organisational committee of 23nd IWSM-MENSURA, METU, Ankara, 25 October, 2013
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INTERESTS

Swimming, yoga and cooking
