

# Seyedmojtaba Noghabaei

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## Education

<b>North Carolina State University (NC State)</b>	<b>2017 – 2021</b> <b>(expected)</b>
<ul style="list-style-type: none"><li>• <b>PhD</b> Civil Engineering (emphasis on computer vision and visual data analytics)</li><li>• <b>MCE</b> Master of Computing and Systems</li></ul>	
<b>University of Tehran</b> (Rank 1 University in Iran)	<b>2013 – 2017</b>
<ul style="list-style-type: none"><li>• <b>BS</b> Civil Engineering</li></ul>	

## Research Experience

<b>Graduate Research Assistant (NC State)</b>	<b>2017 – 2020</b>
<ul style="list-style-type: none"><li>• <b>A Data-driven Approach to High Precision Construction and Reduced Overnight Cost and Schedule (Federal Advanced Research Projects Agency-Energy (ARPA-E) Project):</b> Rendering large scale point cloud using WebGL and OpenGL for construction performance monitoring. Implementation of the virtual environment that can model and simulate construction performance using as-planned BIM and as-built point clouds.</li><li>• <b>An Integrated UGV-UAV System for Construction Site Data Collection:</b> An outdoor robotic system containing a ground robot and a blimp capable of autonomous navigation by visual sensors and collecting real-time visual data for construction progress monitoring and planning.</li><li>• <b>Cloud-based Immersive Remote Inspection System using an Unmanned Aerial Vehicle (UAV):</b> Integrating UAV and 3D 360 cameras with VR for immersive remote inspection and construction quality assessment.</li><li>• <b>Real-time Image Localization and Registration with BIM Using Perspective Alignment for Indoor Monitoring of Construction:</b> Real-time image localization with BIM using perspective alignment for indoor monitoring of construction.</li><li>• <b>Hazard Recognition in an Immersive Virtual Environment: Analysis of Brainwaves and Eye Movements of Construction Workers:</b> Integrating eye-tracking and VR by brain-sensing (EEG) for understanding how construction workers recognize hazards in an immersive virtual environment. The developed platform can analyze worker's brainwave and visual search patterns as the worker search for hazards in a virtual scene. The findings can characterize individuals based on their hazard recognition skills and provide personalized feedback.</li><li>• <b>Trend Analysis on Adoption of Virtual and Augmented Reality in the Architecture, Engineering, and Construction Industry:</b> Capturing the architecture, engineering, and construction industry trends in the adoption of AR/VR technologies through analyzing rounds of the survey from more than 150 industry and research leader.</li><li>• <b>Virtual Manipulation in an Immersive Virtual Environment:</b> Simulation of a virtual assembly process integrating using hand-tracking, wearable haptic sensors, and VR for construction workers training in an immersive environment.</li><li>• <b>Real-Time Interaction and Cost Estimation within Immersive Virtual Environments:</b> VR tool for real-time cost estimation to improving stakeholders' satisfaction rate in construction projects.</li></ul>	

## Industry Experience

<b>Programmer and VR Developer</b>	Tecnosa Research Office, Tehran, Iran	<b>2016 – 2017</b>
<ul style="list-style-type: none"><li>• Bridge management system for maintenance scheduling using Navisworks API and metaheuristic algorithms</li><li>• VR tools for heavy crane simulation and crane technician's training</li><li>• User interface (UI) design for energy analysis systems in BIM</li></ul>		
<b>Intern and Programmer</b>	Imen Sazeh Fadak, Tehran, Iran	<b>2016 – 2017</b>
<ul style="list-style-type: none"><li>• Commercial VR model design for residential buildings</li></ul>		

## Skills

<b>Programming</b>	Python, C#, C++, Matlab, Colab
<b>Software</b>	Microsoft Project, Unity3D, Etabs, Revit, Navisworks, Visual SFM
<b>Systems</b>	Linux (Ubuntu), Microsoft Hololens
<b>Libraries</b>	WebGL, OpenCV, Git (GitHub), Keras, PyTorch, SLAM
<b>Skills</b>	<b>Machine Learning, Computer Vision, AR/VR/MR, Human-Computer Interaction, IoT, Data Analytics, Deep Neural Network, Artificial Intelligence, 3D Scan, and 3D Printing</b>

## Awards and Achievements

Graduate Merit Award (GMA) Fellowship	2017
Ranked First in Dathathon Competition in Construction Research Congress as NCSU Team Leader	2020
Ranked as top 10% of the accepted papers in Construction Research Congress	2020

## Relevant Courses

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| <ul style="list-style-type: none"><li>• Robotic Vision System for Autonomous Navigation</li><li>• User Experience</li><li>• Digital Imaging Systems</li><li>• Principles of Computer Graphics</li><li>• High-Performance Computing</li><li>• Neural Networks</li></ul> | <ul style="list-style-type: none"><li>• Smart Cities (IoT)</li><li>• Project Management</li><li>• Computer Vision</li><li>• Artificial Intelligence</li><li>• Computer Methods and application</li></ul> |
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## Official Review Services

Engineering, Construction and Architectural Management	Reviewer	2021
Journal of Marine Science and Engineering	Reviewer	2020
IEEE Access	Reviewer	2020
International Journal of Construction Management	Reviewer	2019
ASCE Journal of Computing in Civil Engineering	Reviewer	2019
Journal of Construction Engineering and Project Management	Reviewer	2019
ASCE Journal of Infrastructure Systems	Reviewer	2019

## Publications

- **Mojtaba Noghabaei** and Kevin Han. " Object manipulation in immersive virtual environments: Hand Motion tracking technology and snap-to-fit function." *Automation in Construction* 2021 (Accepted)
- **Mojtaba Noghabaei**, Arsalan Heydarian, Vahid Balali, and Kevin Han. "Trend Analysis on Adoption of Virtual and Augmented Reality in the Architecture, Engineering, and Construction Industry." *MDPI Data* 2020
- Emily Berglund, Jacob Monroe, Ishtiak Ahmed, **Mojtaba Noghabaei**, Jinung Do, Jorge Pesantez, Mohammad Ali Khaksar Fasaee, Eleni Bardaka, Kevin Han, Giorgio Proestos, and James Levis. "Smart Infrastructure: A Vision for the Role of the Civil Engineering Profession in Smart Cities." *Journal of Infrastructure Systems* 2020
- Khashayar Asadi, Akshay Kalkunte Suresh, Alper Ender, Siddhesh Gotad, Suraj Maniyar, **Mojtaba Noghabaei**, Kevin Han, Edgar Lobaton, Tianfu Wu, and Smit Anand. "An Integrated UGV-UAV System for Construction Site Data Collection." *Automation in Construction* 2020
- **Mojtaba Noghabaei** and Kevin Han. " Hazard recognition in an immersive virtual environment: Framework for the simultaneous analysis of visual search and EEG patterns." *Construction Research Congress 2020 (CRC2020)*
- Gilmarie O'Neill, Matthew Ball, Yujing Liu, **Mojtaba Noghabaei**, and Kevin Han. " Toward Automated Virtual Assembly for Prefabricated Construction: Construction Sequencing through Simulated BIM." *Construction Research Congress 2020 (CRC2020)*
- **Mojtaba Noghabaei**, Khashayar Asadi, and Kevin Han. "Virtual Manipulation in an Immersive Virtual Environment: Simulation of Virtual Assembly." *Computing in Civil Engineering (i3CE 2019)*, Atlanta, Georgia
- Khashayar Asadi, Rahul Jain, Ziqian Qin, Mingda Sun, **Mojtaba Noghabaei**, Jeremy Cole, Kevin Han, Edgar Lobaton. " Vision-based Obstacle Removal System for Autonomous Ground Vehicles Using a Robotic Arm " *Computing in Civil Engineering (i3CE 2019)*, Atlanta, Georgia
- Khashayar Asadi, Hariharan Ramshankar, **Mojtaba Noghabaei**, and Kevin Han. "Real-time Image Localization and Registration with BIM Using Perspective Alignment for Indoor Monitoring of Construction." *ASCE Journal of Computing in Civil Engineering* 2019
- Balali Vahid, **Mojtaba Noghabaei**, Arsalan Heydarian, and Kevin Han. "Improved Stakeholder Communication and Visualizations: Real-Time Interaction and Cost Estimation within Immersive Virtual Environments." *Construction Research Congress 2018*, pp. 522-530. 2018.
- Navid Kayhani, Hosein Taghaddos, **Mojtaba Noghabaei**, and Ulrich (Rick) Hermann. " Utilization of Virtual Reality Visualizations on Heavy Mobile Crane Planning for Modular Construction." *35<sup>th</sup> International Symposium on Automation and Robotics in Construction (ISARC2018)*
- **Mojtaba Noghabaei**, Alex Albert, and Kevin Han. " Study of Consumer-grade EEG and Eye-tracker to Analyze Brain and Pupillary Responses to Construction Hazards in an Immersive Virtual Environment" *ASCE Journal of Construction, Engineering, and Management* 2020 (Under Review)