Dominic Roberts

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EDUCATION

Jan. 2016 – present
Computer Science PhD Candidate, University of Illinois at Urbana-Champaign, Urbana, IL.
- Collaborators: Prof. David Forsyth, Prof. Mani Golparvar-Fard.
- Thesis topic: Vision-based productivity monitoring of agents operating in built environments.
- Overall GPA: 3.97/4.00

Sep. 2011 – Aug. 2015
MSc in Applied Mathematics, Université de Lille 1, Lille, France, and
MSc in Engineering with specialization in Machine Learning/Data Science, Ecole Centrale de Lille, Lille, France.

Sep. 2009 – Aug. 2011
Undergraduate-level math & theoretical physics classes, Lycée Louis Le Grand, Paris, France.

RESEARCH INTERESTS

My research focus is on computer vision and its applications to construction management, particularly in the area of activity analysis of construction resources. Ongoing projects include

- action segmentation methods that are informed by 2D pose
- semantic segmentation of scenes depicting built environments

PUBLICATIONS

(journal submission under review)
Synthesizing pose sequences from 3D assets for vision-based activity analysis
Wilfredo Torres Calderon, *Dominic Roberts*, Mani Golparvar-Fard

(journal submission under review)
Human-object interaction recognition for automatic construction site safety inspection
Shuai Tang, *Dominic Roberts*, Mani Golparvar-Fard

Jan. 2020 (forthcoming)
Vision-based construction worker activity analysis informed by body posture
Dominic Roberts, Shuai Tang, Wilfredo Torres Calderon, Mani Golparvar-Fard
Journal of Computing in Civil Engineering

Sep. 2019
End-to-end vision-based detection, tracking and activity analysis of earthmoving equipment filmed at ground level
Dominic Roberts, Mani Golparvar-Fard
Automation in Construction

Jul. 2019
An annotation tool for benchmarking methods for automated construction resource pose estimation and activity analysis
Dominic Roberts, Mingzhu Wang, Wilfredo Torres Calderon, Mani Golparvar-Fard
2019 International Conference on Smart Infrastructure and Construction (ICSIC)

Jun. 2019
Annotating 2D imagery with 3D kinematically configurable assets of construction equipment for training pose-informed activity analysis and safety monitoring algorithms
Dominic Roberts, Yunpeng Wang, Ali Sabet, Mani Golparvar-Fard
2019 ASCE International Conference on Computing in Civil Engineering

Mar. 2018 **Vision-based construction activity analysis in long video sequences via Hidden Markov Models: experiments in earthmoving operations**
Dominic Roberts, Mani Golparvar-Fard, Juan Carlos Niebles, JunYoung Gwak, Ruxiao Bao: 2018 Construction Research Congress (CRC)

Jun. 2017 **Detecting and Classifying Cranes Using Camera-Equipped UAVs for Monitoring Crane-Related Safety Hazards**
Dominic Roberts, Mani Golparvar-Fard
2017 ASCE International Workshop on Computing in Civil Engineering (IWCCE)

WORK EXPERIENCE

Jun.-Aug. 2017 **Internship at AutonomouStuff, Peoria, IL**

- Implemented software capable of detecting & localizing pedestrians, cars and trucks in real time on the NVIDIA PX2

May-Aug. 2015 **Internship at Bluefern Computing Centre, Christchurch, New Zealand**.

- Designed software facilitating development of equations modelling neurovascular coupling.

Jan.-Jul. 2014**:** **Internship at Rookiz, La Défense, France:**

- Developed and implemented new features for the website of a Kickstarter-style start-up company.

IT SKILL SET

Programming languages:	*Proficiency: Python, C/C++, MATLAB* *Experience with: JavaScript, Java, R, Swift*
Deep learning frameworks:	*Proficiency: PyTorch, TensorFlow* *Experience with: Caffe, MatConvNet*
Other:	*GNU/Linux, Unity, Google Tango, ROS, SQL, HTML/CSS*