

BASEL EL KHAPERY

Graduate Teaching & Research Assistant

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Elkton, Maryland, USA



SUMMARY

A passionate and effective educator, and experienced researcher with 4-years' experience in building construction and project management. I delved into green building regulations, standards, and rating systems during my master's degree. My current specialty area is focused on Construction Automation (CA), Artificial Intelligence (AI) with utilization of robotics. This includes drone applications in the construction industry, i.e., automated wall construction. Research mainly exploring how to facilitate ways to ensure construction tasks are completed more efficiently and in accordance to standards.

EXPERIENCE

Graduate Teaching Assistant 09/2022 - 12/2022
University of Delaware Delaware, USA

CIEG292: Environment, Health and Safety

- Assist faculty in delivering course material.
- Work with students to promote their learning and development.
- Prepare and proctor examinations.
- Grading Exams.

Graduate Teaching Assistant 02/2022 - 06/2022
University of Delaware Delaware, USA

CIEG213: Civil Engineering Materials Laboratory

- Lecturing and independently conducting materials lab sessions.
- Work with students to promote their learning and development.
- Grading assignments & labs.

Graduate Teaching Assistant 09/2021 - 12/2021
University of Delaware Delaware, USA

CIEG291: CAD and BIM in Construction

- Assist faculty in delivering course material.
- Work with students to promote their learning and development.
- Grading lab assignments.

Graduate Teaching Assistant 02/2021 - 06/2021
University of Delaware Delaware, USA

CIEG191: INTRO TO CONSTRUCTION ENGINEERING and MANAGEMENT

- Assist faculty in delivering course material.
- Work with students to promote their learning and development.
- Prepare and proctor examinations.
- Grading Exams.

Graduate Teaching Assistant 09/2020 - 12/2020
University of Delaware Delaware, USA

CIEG292: Environment, Health and Safety

CIEG393: Construction Means and Methods

- Assist faculty in delivering course material.
- Work with students to promote their learning and development.
- Prepare and proctor examinations.
- Grading Exams.

ACHIEVEMENTS

- 🏆 AUD M.S.C.M. Award 2019 - Graduating students with the highest academic standing
- 🏆 1st place AUD 7th Annual Wooden Bridge Completion 2015
- 🏆 Winner of PCI concrete beam completion in Dubai 2014
- 🏆 3rd place AUD Annual Wooden Bridge Completion 2014
- ☆ Winner of AUD wooden popsicle Truss competition 2013

CERTIFICATION

LEED Green Associate (GA)
Green Building Certification Institute
(Received Aug 14, 2020)

SKILLS

Project Management
AutoCAD
Revit
Primavera 6
Python
Matlab
Excel
Photoshop
Green Building
Logic Programming
Artificial Intelligence

EXPERIENCE

Project Engineer Intern 06/2020 - 08/2020
Wohlsen Construction Philadelphia, USA

Project: Heartis Yardley Senior Housing Community

- Co-ordinated with the team of 6 people to meet project goals.
- Gaining skills in construction processes.
- Learning how construction in the US differs from the Middle East.
- Quantity surveying, BOQ quantity takeoff & cost estimation for projects bidding submissions.

Graduate Teaching Assistant 02/2020 - 06/2020
University of Delaware Delaware, USA

CIEG191: INTRO TO CONSTRUCTION ENGINEERING and MANAGEMENT

- Assist faculty in delivering course material.
- Work with students to promote their learning and development.
- Prepare and proctor examinations.
- Grading Exams.

Graduate Teaching Assistant 09/2019 - 12/2019
University of Delaware Delaware, USA

CIEG222/LARC222: INTRODUCTION TO SURVEYING

- Lecturing and assist faculty in field lab sessions
- Work with students to promote their learning and development
- Grading assignments & labs.

Projects Coordinator and Managing Assistant 06/2015 - 08/2019
Delta Al-Wadi Contracting Company Dubai, UAE

Project: Commercial Building (2B+G+11) - Barsha South Third
Project: Commercial Building (2B+G+14) - Barsha First

- Maintaining and monitoring project plans, project schedules, budgets and expenditures.
- Evaluating project risks and issues and provide mitigation responses where applicable.
- Gaining skills in construction processes.
- Learning construction engineering controlling systems.
- Gaining proficiency in construction engineering quality control and quality assurance.
- Completing quantity surveying.
- Scheduling and creating weekly look ahead programs.
- Preparing all the Handing over Documents to client.
- Preparing payment Certificates for Every progress period.
- Handling Variation submittals, Extension of Time Claims during the projects period.

Summer Internship 05/2014 - 08/2014
Construction & Re-construction Engineering Company Dubai, UAE

Project: Stella Tower- Dubai Marina

- Gaining skills in construction processes.
- Learning construction engineering controlling systems.
- Gaining proficiency in construction engineering quality control and quality assurance.
- Gaining experience with reinforcement, formwork, and casting of foundation and shear walls.
- Gaining experience with masonry work: partitioning walls.

SKILLS

Unmanned Aerial Vehicle (UAV)

Automation & Robotics

LANGUAGES

English Proficient ●●●●●

Arabic Native ●●●●●

French Beginner ●●●●●

VOLUNTEERING

Vice-Chair

COE EmPOWER

09/2021 - Ongoing
University of Delaware

Empathic Peers Offering Wisdom, Encouragement, and Resources (EmPOWER) is a College of Engineering (CoE) initiative to promote mental health and wellness among engineering graduate students.

- Attend all COE steering committee meetings, and shall lead meetings if the Chair is not present.
- Manage the EmPOWER calendar.
- Amend the current Bylaws to reflect any changes voted upon by the Steering Committee as outlined in Article VIII(1).
- Act as a treasurer for allocating purchases using GSO Graduate College funding.

CIEG Mentor

COE EmPOWER

01/2020 - 09/2021
University of Delaware

Empathic Peers Offering Wisdom, Encouragement, and Resources (EmPOWER)

- Help newly admitted graduate students in the department of Civil Infrastructure and Environmental Engineering (CIEG) to get settled in, and assist them as necessary with navigating campus life.

Active Member & Volunteer

ASCE student chapter

01/2012 - Ongoing

EDUCATION

Ph.D. in Civil Infrastructure and Environmental Engineering 09/2019 - Ongoing

[College of Engineering - University of Delaware](#)

GPA | 3.97 / 4

Masters of Science in Construction Management 09/2017 - 05/2019

[Engineering College - American University in Dubai](#)

GPA | 3.97 / 4.0

BSc. in Civil Engineering 09/2011 - 05/2015

[Engineering College - American University in Dubai](#)

GPA | 3.36 / 4.0

PUBLICATIONS

Exploratory Research towards Automated Masonry Construction using UAVs 01/2022

[Creative Construction Conference](#)

Basel Elkhapery, Edgar P. Small

Unmanned autonomous vehicles (UAVs), also known as drones, are pervasive in modern society for both recreational and business purposes. This paper reports on exploratory research to investigate current efforts in automated construction of masonry walls using drones and drone swarms. Masonry was chosen due to the repetitive nature of the processes, which increases the probability of successful implementation. The results of a literature review are presented to establish the state of the art in this area. The proposed approach is evaluated based on the construction quality in accordance with standards, which entail both accuracy and precision requirements in the laying process.

[doi:10.1088/1757-899X/1218/1/012005](https://doi.org/10.1088/1757-899X/1218/1/012005)

Feasibility Assessment of Renovating Schools in Arid Regions 2022

[IOP Conference Series: Earth and Environmental Science](#)

Basel Elkhapery, Peiman Kianmehr, Ryan Doczy

Nowadays, renovation of buildings including schools is a common practice to enhance their indoor environmental conditions and resource efficiency, and to reduce their operation cost. Construction industry always has its reservation regarding the perceived excessive renovation costs when greening a building. Such perception has been discouraged property owners from greening and certifying their existing buildings according to USGBC's Leadership in Energy and Environmental Design (LEED) rating systems. This research established an optimization model with ability of distinguishing and sorting LEED feasible credits according to their costs to achieve cost-effective LEED certifications. The assessments' results proved that less than 1% and 5% of total construction cost should be devoted to modify buildings as per LEED guideline and certify them up to Gold certificate or Platinum certificate, respectively. Attaining platinum certificate resulted in 27% and 30% water and energy consumption reductions, respectively. The estimations revealed that the projected capital spending in energy and water conservation might be returned in a maximum period of seven years with lower utility bills.

[doi:10.1088/1755-1315/966/1/012004](https://doi.org/10.1088/1755-1315/966/1/012004)

VOLUNTEERING

Student Member

Emirates Green Building Council

01/2020 - 01/2021 Dubai

Supports the promotion and development of Sustainable Buildings in the United Arab Emirates

Teaching Assistant

Engineering College - AUD

01/2015 - 05/2015 Dubai

Calculus and Physics tutoring

STRENGTHS

★ Energetic passion with learning

★ Leadership & Project management

REFERENCES

Dr. Sue McNeil

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Dr. Peiman Kianmehr

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pkianmehr@aud.edu

Dr. Ri Na

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nari@udel.edu

PUBLICATIONS

Benefits of Retrofitting School Buildings in Accordance to LEED V4

09/2020

[Journal of Building Engineering](#)

Basel Elkhapery, Peiman Kianmehr, Ryan Doczy

This research is performed on a random sample of 9 schools situated in Dubai, UAE. Primarily, the study aims to bridge the existing gap and provide detailed quantitative analysis associated with transforming school buildings to become green or LEED certified. Feasibility assessment has been carried to determine how practical is the processes of retrofitting school buildings. A comprehensive questionnaire was developed to systematically identify the existing conditions of the building and accordingly an optimization model was developed to opt the most cost-effective techniques and technologies for retrofitting. Moreover, the research elaborates to what extent the implementation of local green building regulation on existing schools improves the resource efficiency of the buildings when compared with internationally- recognized green building rating systems such as different tiers of LEED.

[doi:10.1016/j.jobe.2020.101798](https://doi.org/10.1016/j.jobe.2020.101798)

GRADUATE COURSES

[Planning & Scheduling in Construction \(AUD\)](#)

Grade: A

[Advanced Decision Analysis \(AUD\)](#)

Grade: A

[Construction Estimating \(AUD\)](#)

Grade: A

[Construction Laws & Regulations \(AUD\)](#)

Grade: A

[Construction Equipment & Operations \(AUD\)](#)

Grade: A

[Lean Construction \(AUD\)](#)

Grade: A-

[Managing Organizations and Leading People \(AUD\)](#)

Grade: A

[Accounting Information & Management Decisions \(AUD\)](#)

Grade: A

[Civil Infrastructure Systems \(UDEL\)](#)

Grade: A

[Introduction to Stat Analysis 1 \(UDEL\)](#)

Grade: A-

[Decision Tools for Policy Analysis \(UDEL\)](#)

Grade: A

[Design & Analysis of Experiments \(UDEL\)](#)

Grade: A

[Advanced Data Analysis \(UDEL\)](#)

Grade: A

[MATLAB for Engineering \(UDEL\)](#)

Grade: A

[Engineering Project Management \(UDEL\)](#)

Grade: A

[Risk Analysis \(UDEL\)](#)

Grade: A

[Advanced BIM \(UDEL\)](#)

Grade: A

RESEARCH PROJECTS

Construction Automation & Robotics

01/2020 - 12/2022

Delaware, USA

University of Delaware

- Building a UAV that can autonomously build a masonry wall while utilizing sensors and other tools like, Motion Capture System and electromagnetic grippers.
- Developing an algorithm utilizing logic programming language to intelligently sequence bricks and send commands to the UAV.

Construction 4.0

09/2019 - 06/2020

Delaware, USA

University of Delaware

- Investigate and define construction 4.0 with a thorough review and exploration of existing literature about the construction industry's capability to transform and adopt its concepts.
- Investigate recognized pillars for both the industry and construction revolutions.
- Study how construction 4.0 can be implemented and how future construction projects might operate with a representation of some hypothesized scenarios.

Construction Materials Laboratory

01/2015 - 05/2015

Dubai, UAE

American University in Dubai

Assisting faculty research in the following areas:

- Porous concrete
- High Sulfate resistant concrete
- Chloride resistant concrete
- Impervious concrete

Construction Materials Laboratory - Capstone Project

01/2015 - 05/2015

Dubai, UAE

American University in Dubai

Designing and casting several concrete mix designs to study the following:

- Effects of GGBS on Ordinary Portland Cement Concrete
- Effects of Fly Ash on Ordinary Portland Cement Concrete
- Effects of Micro silica on Ordinary Portland Cement Concrete

Construction Materials Laboratory - 7th Annual Wooden Bridge competition

01/2015 - 04/2015

Dubai, UAE

American University in Dubai

- Design of wooden bridge in compliance with AUD competition criteria.

Construction Materials Laboratory - PCI competition

09/2014 - 12/2014

Dubai, UAE

American University in Dubai

- Structural design of complex concrete beam.
- Design of concrete mix.
- Casting of complex beam design in collaboration with Dubai Precast LLC.

Construction Materials Laboratory - 6th Annual Wooden Bridge competition

01/2014 - 04/2014

Dubai, UAE

American University in Dubai

- Design of wooden bridge in compliance with AUD competition criteria.