

EDUCATION

Doctor of Philosophy 2017 - 2020 Mechanical Engineering

McGill University

Master of Science 2013 - 2015

> Mechanical Engineering Khalifa University

Bachelor of Science 2009 - 2013

> FIRST CLASS HONOURS Mechanical Engineering Khalifa University

EXPERTISE

Optimization

Machine learning

CAD/3D modeling

Software development

Uncertainty quantification

Scientific computing

AWARDS

Doctoral research award 2018 Fonds de Recherche du Québec

McGill engineering doctoral award 2017 McGill University

ADNOC graduate fellowship 2013 Khalifa University

RESEARCH INTERESTS



Artificial intelligence in design



Design for changing requirements



Numerical simulation



Systems optimization



Surrogate modelling

PUBLICATIONS



Google Scholar Profile

Khalil Al Handawi, PhD

RESEARCH

"Optimization of infectious disease prevention policies using agent-based modeling"

How can we apply the principles of design and decision-making to help bring the pandemic under control? To answer this question, I modeled how an infectious disease spreads in a small population. Diseases such as COVID-19 spread through social interaction. I programmed intelligent agents to model a complex social system. I used optimization to determine the critical amount of intervention necessary to keep the disease in check. I used GPU acceleration for the agent-based simulation and obtained performance enhancements of up to 100X a CPU simulation. The policies I obtained had a socio-economic impact that is 5 times less than that of a complete lock-down.

• python • Qt • Online open-source code • CUDA

"Optimization-driven set-based design for dynamic design requirements"

How do you design a component when the design requirements can change at any moment and without advance notice? That is the question my dissertation tries to answer. To do so, I came up with design metrics for qualitative descriptions such as flexibility and robustness. I used optimization, and machine learning to obtain thousands of designs. This is a 1000 fold increase in the number of alternatives presented to clients in the aerospace industry. This culminated in a technology transfer at GKN aerospace to provide them with a **competitive edge** and shorten lead times.











WORK EXPERIENCE

Systems Optimization Lab, McGill University

CURRENT, FROM JAN 2021

Postdoctoral Researcher

- Built and implemented a COVID-19 predictive model in a time of uncertainty.
- Came up with a project for students to understand multidisciplinary optimization.

McGill University

JAN 2017 - DEC 2020 (FT)

Research and teaching assistant

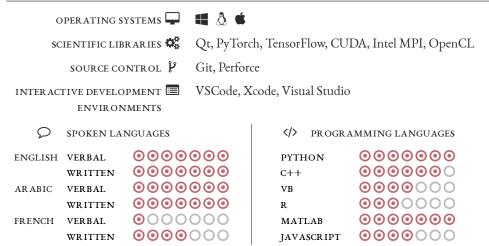
- Came up with new ways to teach programming skills to engineering students.
- Used design optimization and set-based design to give designers a competitive edge.

GKN Aerospace Engine Systems Visiting researcher

SUMMER 2017, 2018, 2019 (PT)

- Transfer academic research to the industry by providing training and workshops.
- Collect information about industrial workflows to guide academic research.

SKILLS



COMMUNICATION SKILLS 🏖

Excellent written and verbal presentation skills. Data analysis, proposal writing, and questionnaire design.