

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

McGill University

ADNOC Graduate fellowship 2013

Khalifa University

RESEARCH INTERESTS



2017

Artificial intelligence in design



Design for changing requirements



Numerical simulation



Systems optimization



Surrogate modelling

Khalil Al Handawi, PhD

RESEARCH

"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.

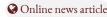
python











"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. The policies I obtained had a socio-economic impact that is **5 times less** than that of a complete lock-down.









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

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

Research and teaching assistant

JAN 2017 - DEC 2020 (FT)

- 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.

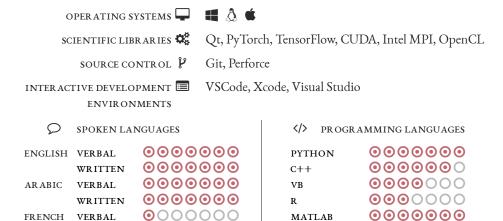
GKN Aerospace Engine Systems Visiting researcher

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.

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SKILLS



COMMUNICATION SKILLS

WRITTEN

Excellent written and verbal presentation skills.

JAVASCRIPT

Data analysis, proposal writing, and questionnaire design. Attention to detail and ability to identify underlying trends and patterns.

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