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ABOUT ME

I believe that physics and artificial intelligence should be two sides of the same coin. One cannot exist without the other. How? By cross-validation. In this way, the toughest physics and mathematics problems can be solved! This philosophy is what drives my research.

EDUCATION

- 2017 – 2020 **Doctor of Philosophy**
Mechanical Engineering
McGill University
- 2013 – 2015 **Master of Science**
Mechanical Engineering
Khalifa University
- 2009 – 2013 **Bachelor of Science**
FIRST CLASS HONOURS
Mechanical Engineering
Khalifa University

EXPERTISE

Optimization

Machine learning

CAD/3D modeling

Software development

Uncertainty quantification

Scientific computing

AWARDS

- 2018 **Doctoral research award**
Fonds de Recherche du Québec
- 2017 **McGill engineering doctoral award**
McGill University

REFERENCES

Prof. Michael Kokkolaras

POSITION Associate Professor
EMPLOYER Department of Mechanical Engineering, *McGill University*
EMAIL michael.kokkolaras@mcgill.ca

Khalil Al Handawi, PhD

Engineer, designer, and researcher

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 dissertations tries to answer. To do so, I came up with design metrics for qualitative descriptions such as flexibility and robustness. I used optimization, automation and machine learning to obtain thousands of possible designs. My research culminated in a technology transfer at GKN aerospace.

python C++ MATLAB R Online open-source code

“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. Intelligent agents can be used to model a complex social system. Optimization can be used to determine the critical amount of intervention necessary to keep the disease in check.

C++ CUDA python Qt Online open-source code

WORK EXPERIENCE

Systems Optimization Lab, McGill University CURRENT, FROM JAN 2021
Postdoctoral Researcher

- Build and interpret data-driven models for COVID-19.
- Prepare teaching course material for optimization courses.

McGill University JAN 2017 – DEC 2020 (FT)
Research and teaching assistant

- Supervise and teach undergraduate courses
- Advance the fields of design optimization and surrogate modeling.

GKN Aerospace Engine Systems SUMMER 2017, 2018, 2019 (PT)
Visiting researcher

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

PUBLICATIONS

- 2021 Optimization of Infectious Disease Prevention and Control Policies Using Agent-based Modeling
- 2021 Optimization of Design Margins Allocation When Making Use of Additive Remanufacturing
- 2020 Scalable Set-based Design Optimization and Remanufacturing for Meeting Changing Requirements
- 2019 A Lifecycle Cost-driven System Dynamics Approach for Considering Additive Re-manufacturing or Repair in Aero-engine Component Design

SKILLS

Goal Oriented

I believe in action over long-winded discussions. I listen to everyone's viewpoints and use my judgement to immediately act based on consensus to achieve goals quickly and efficiently.

Physical Dexterity

I specialize in gymnastics and calisthenics training for sound body and mind necessary to maintain focus needed for innovative problem-solving.

Passionate

I have been interested computers and video games as long as I can remember. I love using my knowledge of physics and engineering to bridge the gap between the real and virtual computer worlds.