

## CONTACT

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🌐 Botengu

in Ken Nsiempba

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## SKILLS

### Parametric Design

### Solidworks

### Rhino3D

### Blender

### AutoCAD Inventor

### Grasshopper3D

### Python

### C#

### C++

### Java

### R

### Matlab

### HTML

### CSS

### Microsoft Office

# KEN M. NSIEMPBA

*I use code to render shapes and  
I use shapes to visualize data*

## WORK EXPERIENCE

### Computational Designer

Podform3D, Montreal, Quebec, Canada

Sep '21 - Apr '22

- Modeled medical orthotics parametrically using Rhino3D and Grasshopper3D
- Developed an end-to-end design algorithm to go from a scanned patient's foot, as a point-cloud, to a finished medical orthotic represented by an extruded parametric surface
- Used **machine learning** tools such as **principal component analysis** to smartly reorient the scans of patients' feet
- Integrated features required by customers on a frequent basis

### Research Associate

University of Waterloo, Waterloo, Ontario, Canada

Feb '21 - Feb '22

- Reduced the weight of a golf club by implementing topological optimization and latticing
- Created a design of experiment to study the manufacturability of metal samples as a function of geometrical parameters
- **Developed statistical models** to predict the manufacturability of 3d printed parts partly by **plotting and visualizing** surface roughness as a function of a sample's thickness and overhanging angle
- Directed and supervised the writing of scientific articles
- Oversaw the 3D printing of items and assisted the technicians in post-manufacturing processes

### Engineering Intern

Pratt & Whitney Canada, Longueuil, Quebec, Canada

May '17 - Dec '17

- Investigated 3D printing and topology optimization as methods for decreasing the weights of engine parts and increasing the engine's efficiency
- Co-organized workshops where designers and supply chain employees met to identify potential parts which could be light-weighted using topology optimization
- Generated resources that summarized information on suppliers of 3D printing equipment/training to help employees better navigate the 3D printing industry
- Led meetings and supervised a team of designers to redesign the chosen parts
- Followed up on and ensured the completion of the redesigning process
- Created 2D drawings of mechanical parts such as engines' brackets

## ACHIEVEMENTS

### Rapid+TcT Conference

**2019**

I was the second runner up for the poster challenge, winning a 250\$ (USD) prize in 2019

### CanadaMakes3D Challenge

**2018**

I was a finalist of the Canada Makes 3D challenge

## EDUCATION

### MASc - Mechanical & Mechatronics Engineering

Sep '18 - Oct '20

University of Waterloo - Waterloo, Ontario, Canada

Thesis' title: Coupled Experimentally-Driven Constraint Functions and Topology Optimization utilized in Design for Additive Manufacturing

### Bachelor - Mechanical Engineering

Sep '13 - May '18

McGill University - Montreal, Quebec, Canada

I specialized in computational/parametric design of mechanical parts and 3D printing

## PUBLICATIONS

### Geometrical Degrees of Freedom for Cellular Structures Generation: A New Classification Paradigm

UGC Listed

Appl. Sci. 2021, 11, 3845

<https://www.mdpi.com/2076-3417/11/9/3845>

Status: Accepted and Published

## PROJECTS

### My personal website

Sep '20

**Tool:** Python, HTML, CSS, Ruby, JavaScript, Markdown

I developed a website using GitHub Pages to display my projects. The projects I have done have helped me reinforce my knowledge of python, and python libraries such as **matplotlib**, **numpy**, **math**, **scipy**, **skimage**, **visvis**, **sklearn**, **Tensorflow**, **scikit**, **yahoo finance**, **bqplot**.



### My 3D printer

Aug '15

**Tool:** Reprap kit

During my research internship, I was eager to learn about 3D printing technologies. I ordered the parts of a reprap printer (Prusa i3) and built it from scratch.

## EXTRACURRICULAR

- I was the VP external for the McGill Additive Manufacturing Students' Society between 2015 and 2018
- I was a member of the McGill Robotics team between the years 2013 and 2015