JOEL HILMERSSON

Architect
Structural Engineer
Programmer

About

Versatile ***computational designer*** and ***engineer*** with a background in architecture and structural engineering, currently working within the field of software for design and manufacturing. My main interest lies in computational tools for ***geometry***, ***fabrication*** and ***design space exploration***; and how we can leverage technology to turn innovative design concepts into physical reality.

Contact

SE5 0DB
London, UK

d.j.hilmersson
(at)gmail.com

www.
joelhilmersson.com
github.com/joelhi

Education

M. Arch: Architecture & Urban Design 09.2017 - 06.2019
Chalmers University of Technology

Master in architecture & urban design with a focus on digital design and fabriction.

M. Sc: Structural Engineering & Building Technology 09.2016 - 06.2019
Chalmers University of Technology

2016 - 2017 TU Delft, ERASMUS exchange
Studies in structural engineering with a focus on computational mechanics.

Thesis project: Isogeometric analysis & form finding

B. Sc: Architecture & Engineering 09.2012 - 06.2015
Chalmers University of Technology

Interdisciplinary program at the faculty of architecture.

Professional Experience

Ai Build 06.2023 -
Computational Geometry Engineer - London UK

Working as part of the computational geometry team
- **Developing geometric algorithms to automate the process for robotic additive manufacturing**
- **Implementing research papers to bring state of the art capabilities into our geometric engine**
- **R&D on topics related to data driven design for manufacturing**
- **Providing day to day assistance to our Customer Success team on anything geometric**

Skills: *Java, Large Format Additive Manufacturing, Software development, Data Structures & Algorithms*

Generative Engineering 01.2023 - 05.2023
Computational Engineer - London UK

A start up developing a cloud based platform enabling generative design in engineering at scale.
- **Developed generative models for various engineering applications, mainly focussed on generative geometry and lo-fi fabrication analysis**
- **Implementing adapters linking design exploration to cloud based FE-simulation (SimScale) using their API**

Time at generative was cut short due to funding uncertainty.
Skills: *Computational Geometry, Python, Generative Algorithms, Software Development*

AKT II - Applied Research Team 02.2020 - 01.2023
Computational Designer - London UK

Working in the specialist computational design team, on a mix of design, software and research projects.
- **Lead Developer for the in house interoperability toolkit Reakt (C#, Grasshopper)**
- **Complex geometry modeling and FEA analysis for projects of all scales, from sculptures to airports**
- **Collaborating with world renowned architects such as Foster + Partner, Zaha Hadid etc.**
- **Contributed to a Horizon2020 research project on collaborative design in VR**
- **Internal research on topics related to modeling, meshing techniques, workflow automation etc.**

Skills: *Rhino / Grasshoper, Visual Studio, C#, Python, git, various FE-analysis packages and APIs*

Sunneroe Architects 08.2019 - 11.2019
Computational Designer - Gothenburg Sweden

Short term employment while looking for jobs abroad.
- **Developed a grasshopper toolkit to design apartment layouts generatively (Python)**

Bollinger + Grohmann 05.2018 - 09.2018
Intern - Oslo, Norway

3d Modeling, Structural Analysis and Multi Objective Optimisation. Mainly early stages / competitions.

Knippers Helbig Advanced Engineering 06.2015 - 06.2016
Intern - Stuttgart, Germany

Computational design for projects globally focussing on complex geometry, with architects such as ACME, Diller Scofidio + Renfro and UN Studio

Skills: *Grasshopper, Nurbs, FEA*

Academic Involvment

PrismArch (Horizon 2020 research project) 11.2020 - 01.2023

Involved in the PrismArch Horizon project while at AKT II. Main contribution to the following deliverables.

- **PrismArch Deliverable 2.3:**

Final revised version of parametric space of design, algorithms for AI assisted editing/design in VR, and algorithms for designer modelling

Contributed chapter 4.2.3 documenting my research on applying the evolutionary algorithm presented to shape optimsation for shell structures, conluded as a framework in grasshopper developed in C#.

- **PrismArch Deliverable 1.2:**

Elaborated report of cross-discipline principles-rules-constraints, and interfaces definition for cross-disciplinary and multi-simulation perspectives in VR

Contributed chapter 2.1, 2.2 and 2.3 featuring a review of current AEC ontologies.

Advances In Architectural Geometry 2018

Local host and participant at the workshop **Digitally Implicit Morphologies**.

Conference Papers

IASS 2023 Conference Paper:
Design Space Exploration of Shell Structures Using Quality Diversity Algorithms
K. Sfikas, A, Liapis, **J. Hilmersson**, J. Dudley, E. Tibuzzi, G. Yannakakis

IASS 2021 Conference Paper:
The Geldeford Riband
D. Godfrey, J. Dudley, ***J. Hilmersson***

IASS 2019 Conference Paper:
Isogeometric Analysis and Form Finding of Thin Elastic Shells
J. Hilmersson, J. Olsson, M. Ander, Prof. Fredrik Larsson

Teaching Involvement

2015 - 2019
Tutor, Chalmers University
Space & Geometry: Architecture & Engineering Year 1
Structural Mechanics: Architecture & Engineering Year 3
Solid Mechanics: Civil & Architecture & Engineering Year 2
Exploring Architecture using Digital Design: Architecture Year 1+2
Mathematical Sketching: Architecture & Engineering Year 1
Mathematical Analysis: Architecture & Engineering Year 1
Form & Technics: Architecture Year 1

Software & Knowledge

Modeling and Graphics
Rhino/Grasshopper (Advanced),
Revit/Rhino.Inside (Basic)
Vray, AdobeCS (AI,PS,ID)

Analysis and Simulation
Sofistik
SAP2000 (+API)
Karamba, Kangaroo etc.
APIs ETABS, Robot, Simscale

Programming
C# (Advanced)
Python (Good)
Java (Good)
C++ (General C# interop)
Rust (Sparetime)
git

Manufacturing
Desktop 3D Printing using both SLA and FDM
General knowledge of
- CNC milling
- Large Format Additive Manufacturing
- G-code