JOEL HILMERSSON

Architect
Structural Engineer
Programmer

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About
Versatile computational designer with a background in architecture and structural engineering and 5 years experience working on design projects, software and R&D in Sweden, Norway, Germany and the UK.

My main interest lies in computational tools for geometry, analysis and creativity; and how we can leverage technology to turn innovative concepts into physical reality.

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.

Academic *Research & Teaching*

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

Experience

Generative Engineering 01.2023 -
Computational Designer - London UK

Start-up developing a cloud-based platform enabling algorithm-driven design approaches for engineering at scale.

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. My role was focusing on interdisciplinary collaboration, computational geometry for fabrication and software interoperability. Some highlights include:

- **Red Sea Project: Hotel 12 - Foster + Partner**
- **Various Sculptures - Dewitt Godfrey**
- **Khudi Bari @ RA Summer Show - Marina Tabassum**
- **Lead developer of Reakt: AKT II's Interoperability toolkit**
  Since releasing a new version of Reakt in May 2021 it had over 40 users in the company who have exported more than 5,000 models.

Skills: Rhino, Gh, Visual Studio, C#, C++, Python, 3d printing, git and various FE-analysis packages and their APIs

Sunnero Architects 08.2019 - 11.2019
Computational Designer - Gothenburg Sweden

Short term employment while looking for jobs abroad. Provided development of a grasshopper toolset to aid the sketching process of housing projects.

Bollinger + Grohmann 05.2018 - 09.2018
Intern - Oslo, Norway

3d Modeling/Structural analysis/Optimisation/Graphics (Rhino,Revit,Adobe CC, Karamba/Octopus). Mainly early stages / competitions with among others, Snøhetta, Lund Hagem, Tomas Saraceno.

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

Computational design for projects globally focussing on complex geometry.

- **SAB Headquarters, Leipzig - ACME**
- **Taipei Terminal 3, Competition - UNStudio**
- **St Barths Residence - Diller Scofidio + Renfro**

Skills: Grasshopper, Nurbs, FEA, Facade Design

Software & Knowledge

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

Programming
C# (Advanced)
Python (Advanced)
C++ (General C# interop)
Rust (Basic)
HTML, css, javascript (Basic)
git (github, gitlab)

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

Manufacturing
3D Printing using both SLA and FDM
General knowledge of CNC
milling and KUKA Robots
General knowledge of G-code