

Toivo Säwén

Curriculum Vitae

Toivo Säwén
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Education

Chalmers University of Technology, Gothenburg (2018 - 2019) - Master of Science in Architecture and Engineering

My final year of studies at Chalmers was a combination of architecture studies in the Healthcare Architecture studio, and courses in Advanced Building Physics, as part of the Master programme Structural Engineering and Building Technology. My Master's thesis, in collaboration with Martina Stockhaus, studied air flows in timber roof constructions, through an experimental and numerical study.

Eidgenössische Technische Hochschule, Zürich (2017 - 2018) - MSc., Erasmus+ exchange

My exchange year in Switzerland was focussed on material science, building physics, life cycle analysis and urban microclimate through courses including Wood Material Science, Building Physics: Moisture and Durability, and Urban Physics. I was also introduced to a different building tradition with a strong basis in craftsmanship.

Chalmers University of Technology, Gothenburg (2013 - 2016) - BSc. in Architecture and Engineering

My bachelor studies combined architectural projects with engineering courses and art exercises. This has provided a deeper understanding for how architecture takes shape from - and shapes - technical solutions. It's enabled me to approach problems from different angles, and speak the languages of both the architect and the engineer in all stages of a design process.

Publications

Säwén, T.; Stockhaus, M.; Hagentoft, C-E.; Bunkholt, N.S.; Wahlgren, P. (2021). *Model of Thermal Buoyancy in Cavity-Ventilated Roof Constructions*. To be published in Journal of Building Physics.

Bunkholt, N.S.; Säwén, T.; Stockhaus, M.; Kvande, T.; Gullbrekken, L.; Wahlgren, P.; Lohne, J. (2020). *Experimental Study of Thermal Buoyancy in the Cavity of Ventilated Roofs*. Buildings, 10, p. 8.

Svantesson, M.; Säwén, T. (2019). *Ventilation by Thermal Buoyancy in the Air Cavity of Pitched Wooden Roofs*. Master's thesis. Chalmers University of Technology, Gothenburg.

Relevant work experience

StruSoft AB, Malmö (September 2019 -) - Software engineer, Research and Development

At StruSoft, I am responsible for the development of a web platform for calculation on building energy demand and HVAC system design. This involves development of the calculation core as well as the energy system modelling interface. I am also responsible for our participation in the IEA EBC Annex 75 research project, where the interaction between energy systems and buildings on a district level is studied from a life cycle perspective.

Chalmers University of Technology, Gothenburg (June - August 2019) - Research assistant, Div. of Building Physics

I participated in the SPACES project, performing case studies on buildings with glazed spaces. I also conducted further research based on my Master's thesis, developing an analytical model for air flow in roof constructions.

Integra Engineering AB, Gothenburg (January - June 2019) - Internship, Building Physics

I performed moisture and energy simulations, gaining insight in the real world implications of building design.

Planning authority, Sundsvall municipality (June - August 2018) - Internship, Urban Development

At the municipality I took part in the town's long term development through an urban analysis from a climatic and social perspective and a plan design proposal.

Buro Happold Engineering, Copenhagen (August 2016 - July 2017) - Internship, Data Analysis and Modelling

I worked with simulations of crowd flow in large scale projects such as arenas and hospitals, dealing with the analysis and visualisation of large amounts of data.

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Technical competence

Analysis tools

Excel, Matlab, Kangaroo, Ladybug, TransAT, COMSOL, WUFI, Simapro

My education in engineering has given me the opportunity to use an array of analysis tools, both for structural design, energy, life cycle and crowd flow analysis. This both includes performing complex analyses in 3D environments, as well as efficiently visualising and communicating analysis results to provide input in a design process.

Programming languages and data structures

Python, C#, C++, Java, Javascript, Typescript, Scala, Julia, R, Haskell, Git, IFC, gbXML

My work experience as a software engineer has provided ample opportunity to use different programming languages, which I utilise both to make my tasks more efficient through simple Python scripts, and to build large scale web and desktop applications using Typescript and C++. Working with building analysis, I have used several common data formats like IFC and gbXML to build digital twins. I am also familiar with data analysis languages like R and Julia.

Draughting and 3D modelling software

AutoCAD, Revit Architecture+Dynamo, Archicad, QGIS, Rhinoceros 3D+Grasshopper, 3DSMax, Google SketchUp

Throughout my education and my various internships, I have used CAD- and 3D-modelling software, and am an experienced BIM and GIS user. Through Dynamo and Grasshopper I have made use of my computational skills in achieving design goals.

Rendering tools, Graphic design

V-Ray, Kerkythea, Unity3D, Unreal, Adobe Photoshop, Illustrator, InDesign

Web development

HTML, d3.js, Polymer, React.js, mobx

My education in architecture has trained me in visualising information, both through graphical tools and the development of interactive web platforms, where engineers, architects, researchers and other stakeholders can explore data and models as part of the design and analysis process.

Languages

Swedish: native speaker

English: full professional proficiency

Danish, Norwegian, German: professional working proficiency

Finnish, French: limited working proficiency

Scholarships

Stiftelsen ÅForsks stipendium 2019 for thesis work

Civ. ing. Torsten Janssons stipendium 2019 for thesis work

Other activities

Architecture division, Chalmers Student Union, chairman of the board (2015-2016)

Architecture and Engineering Students' Education Council, chairman of the board (2014-2015)

References

Paula Wahlgren, Associate Professor, Chalmers University of Technology. paula.wahlgren@chalmers.se, +46317721987

Becky Hayward, Associate Director, Buro Happold Engineering. becky.hayward@burohappold.com, +447545938920