

Zack Xuereb Conti

B.E.& A. (Hons) (Melit.), MPhil (Bath), A.&C.E., Ph.D (SUTD)

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PROFESSIONAL STATUS

Licensed architect and civil engineer ("*Perit*") in the Republic of Malta (member state of the European Union).

EDUCATION

Postgraduate 2014 - 2019

Ph.D. in Computational Design

Architecture and Sustainable Design Pillar (ASD)
Singapore University of Technology and Design, Singapore
Supervisors: Sawako Kajijima, Stylianos Dritsas, Alstan Jakubiec, Shaowei Lin

Thesis title: Bayesian Network Metamodels for Inference-driven Design Space Exploration.

Postgraduate 2018 - 2019

Research Scholar (Visiting Ph.D. Candidate)

Harvard Graduate School of Design, USA
August 2018 – February 2019

Postgraduate 2012 - 2013

MPhil in Digital Architectonics

Centre for Advanced Studies in Architecture (CASA)
University of Bath, England
Supervisors: Paul Shepherd, Paul Richens, Chris Williams

Thesis title: Multi-Objective Optimisation of Building Geometry for Energy Consumption and View Quality
Xuereb Conti, Z. (2013). *Multi-Objective Optimisation of Building Geometry for Energy Consumption and View Quality*

Repository: <https://goo.gl/1jRGgi>

Classification: Pass (Classification Equivalence: First Class Honours)
Percentage Equivalence: 78%

The outcome of the thesis research involved a software application capable of: (i) simulation of cooling loads of building geometry, (ii) simulation of view quality in terms its rental value, (iii) multi-objective optimisation to search for trade-off solutions between cooling load and view quality. The application was written from the ground up in Processing language.
Applet demo: <http://vimeo.com/82059088>

Undergraduate**2009 - 2010****ERASMUS Exchange Programme**

Universita degli Studi di Roma "Tor Vergata", Italy
September 2009 – February 2010

Undergraduate**2006 - 2011****Bachelors of Architecture and Civil Engineering**

University of Malta
Majoring in Architectural Design.

Thesis title: Parametric Integrated Design Process

Xuereb Conti, Z. (2011). *Parametric Integrated Design Process: Attempt at Solving Malta's 'loss of Architecture'*.

Repository: <https://goo.gl/cRsvGX>

Classification: Second Class (Upper division)

Grade 'A' in final year undergraduate dissertation.

Grade 'A' in final year undergraduate thesis.

TEACHING EXPERIENCE

Teaching Assistant - University of Malta**2014**

Grasshopper studio (Principal instructor: Irina Miadragovic Vella)

Teaching Assistant - SUTD**2014, 2015**

Introduction to Design Computation (Principal instructor: Sawako Kajima)

Workshop session - SUTD**2017**

Prepared and led a workshop as part of a Master's course on Material Computation. The workshop introduced the use of design of experiments (DOE) methods, namely factorial designs, as a means to engage students towards an intuition-driven approach to engineering simulation tools.

PRACTICE EXPERIENCE

Junior Architect - MJMDA (Malta)**2012****Junior Architect - The Workshop (Malta)****2012****Digital Designer (fabrication) - Dfab Studio (Malta)****2012****Junior Architect - DeMicoli and Associates (Malta)****2013 - 2014**

SCHOLARSHIPS AND AWARDS

Singapore University of Technology and Design President's Graduate Fellowship, 2014

Fully funded five-year Doctoral scholarship

STEPS Scholarship by the Strategic Educational Pathways Scholarships Board (Malta), 2012

Ranked 7th from 103 submissions

Funded the Masters degree

PUBLICATIONS

Wang, S., **Xuereb Conti, Z.**, & Raspall, F. (2019). *Optimization of Clay Mould for Concrete Casting Using Design of Experiments*. Paper presented at the CAADRIA Conference.

Xuereb Conti, Z., & Kaijima, S. (2018). A Flexible Simulation Metamodel for Exploring Multiple Design Spaces. In *Proceedings of the IASS Symposium 2018, Creativity in Structural Design, July 16-20, 2018, MIT, Boston, USA, Caitlin Mueller, Sigrid Adriaenssens (eds.)*

Anderson, D., Perez, K. B., **Xuereb Conti, Z.**, Otto, K., & Wood, K. (2018). *Design Processes of Design Automation Practitioners*. Paper presented at the ASME 2018 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.

Xuereb Conti, Z., & Kaijima, S. (2018). Enabling Inference in Performance-Driven Design Exploration. In *Humanizing Digital Reality* (pp. 177-188). Springer, Singapore.

Xuereb Conti, Z., & Kaijima, S. (2017). A Knowledge-oriented Approach to Performance-driven design Using Probabilistic Graphical Models. In *Proceedings of the International Association for Shell and Spatial Structures (IASS)*.

Kaijima, S., **Xuereb Conti, Z.**, Sakhaei, A. H., & Dunn, M. L. (2016). Parametric Finite Element Contact Analysis and Optimization for Topologically Interlocking Joinery Using Design of Experiments. In *Proceedings of the International Association for Shell and Spatial Structures (IASS) Symposium*.

Sakhaei, A. H., Kaijima, S., **Xuereb Conti, Z.**, & Dunn, M. L. (2016). Integrating User-Defined Elements for Topologically Interlocking Joints and Application in Large Scale Structural Analysis. In *International Association for Shell and Spatial Structures (IASS) Symposium*.

Kaijima, S., **Xuereb Conti, Z.**, & Dunn, M. L. (2016). A Design Oriented Workflow to Prototype Functionally Graded Designs based on Solid Finite Element Analysis. *International Association for Shell and Spatial Structures (IASS)*.

Kaijima, S., **Xuereb Conti, Z.**, & Dunn, M. L. (2015). Parametric Finite Element Contact Analysis for Topologically Interlocking Joinery. *Proceedings of the International Association for Shell and Spatial Structures (IASS)*.

Xuereb Conti, Z., Shepherd, P. and Richens, P. (2015). Multi-objective Optimisation of Building Geometry for Energy Consumption and View Quality. Vienna: Vienna Technical University, pp. 287-294

PRESENTATIONS AND TALKS

Materials Processes + Systems Group, 2019, Harvard Graduate School of Design, Cambridge, USA (*invited*)
Bi-directional design-analysis synthesis using Bayesian networks.

6th Annual BayesiaLab Conference, 2018, Chicago, USA (*invited*)
Metamodeling with Bayesian networks to facilitate intelligent use of engineering simulation.

Digital Structures Group, 2018, Massachusetts Institute of Technology, Cambridge, USA (*invited*)
A bi-directional metamodel for design-analysis synthesis.

IASS 2018, Massachusetts Institute of Technology (*conference*)
A flexible metamodel for exploring multiple design spaces.

Willcox Group (MIT) Workshop: Computational Methods for Design and Control of Next-Generation Engineered Systems, 2018, SUTD, Singapore (*invited*)
A Bayesian network metamodel for design space evaluation and exploration in architectural design.

IASS 2017, Hamburg, Germany (*conference*)

A knowledge-oriented approach to performance-driven design using probabilistic graphical models.

Design Modelling Symposium (DMS) 2017, Versailles, France (*conference*)

A Bayesian network metamodel for design space evaluation and exploration in architectural design.

Architecture Project (AP) 2016, Valletta, Malta (*invited*)

Informing architecture in the age of automation.

IASS 2016, University of Tokyo, Japan (*conference*)

Parametric finite element contact analysis and optimisation for topologically interlocking joinery using design of experiments.

eCAADe, 2015, Vienna, Austria (*conference*)

Multi-objective optimisation of building geometry for optimised energy consumption and view quality.

IASS 2015, Amsterdam, The Netherlands (*conference*)

Parametric contact finite element analysis for redesigning topologically interlocking joinery.

COMPUTATIONAL SKILLS

Fluent in Object Oriented Programming in Python, C#, Java, and Processing

Fluent in linear elastic solid FEA with Abaqus CAE (including contact analysis): GUI and Abaqus scripting

Expert in Rhino3D/Grasshopper packages

Fluent in Grasshopper plug-in development in C#

Expert in design-analysis-optimisation workflows

General experience with computational geometry

Fluent in data handling, manipulation and visualisation in Python

Fluent in statistical modelling and machine learning workflows within Python

General experience with general 3D printing workflows including multi-material printing with Stratasys Objet 3D printer

INTERPERSONAL SKILLS

Fundamentally, my PhD topic of research was grounded in interdisciplinary research. This involved interacting with individuals from completely different fields and thus, improved my interpersonal skills significantly.

LANGUAGES

English (native), Maltese (native), Italian (fluent verbally), German (fluent verbally), Mandarin (basic knowledge)