Filigree Robotics

Submission

About
Filigree Robotics investigates the combination of traditional ceramic craft with robotic fabrication. The project outcome is a new type of porcelain objects, which have been exhibited in national and international venues and spawned as well set of reflective papers. Filigree Robotics is a collaboration of KADK Superformlab - Flemming Tvede Hansen and – KADK - Centre for Information Technology and Architecture (CITA) – Martin Tamke, Henrik Leander Evers and Esben Clausen Nørgaard.

The project received funding from the Danish Dreyers Fond and Statens Kunstfond.
Exhibitions


15th May – 31st July 2018 National Museum of Slovenia (Ljubljana, Slovenia),

4th September – 11th November 2018 Museum of Decorative Arts in Prague (Prague, Czech Republic)

2018  Danish AM Summit, AM Hub. 24. October 2018

2017  3 Days of Design, Officinet, Copenhagen, Danmark. 1. – 3. June 2017

2017  Biennalen for Kunsthåndværk - Museumsbygningen, Copenhagen, Denmark 5.- 27. May 2017


Description

‘Filigree Robotics’ experiments with a combination of the traditional ceramic technique of ‘Overforming’ with 3d Laserscan and Robotic extrusion technique. Shortly told is the technique of ‘overforming’ about forming the ceramic material over a three-dimensional mould. The technique is well known in ceramic craft and has a lineage of use for the making of fine porcelain.

‘Overforming’ allows for an immediate and artistic approach to the creation of the form and invites for experimentation. In Filigree Robotics we combine the crafting of the mould for ‘overforming’ with a parallel running generative algorithm, which is fed by a constant laserscan of the 3d surface of the mould. We have created this algorithm in a way, that it analyses the topology of the mould, identifies high and low points and uses these as starting point for the ornamentation of a toolpath for 3d printing, which follows the movements of the surface.

Critical relation to current processes in crafts

In Filigree Robotics a new developed robotic clay printing process enables new expressions in crafts: the drawing of fine lines of porcelain and to stop and start these at any point with high precision. Starting with lines the project developed a series of further new topological expressions in clay printing and combines these with the further processing of the raw clay to triple fired glazed porcelain. The project points here at the reality and richness of material processes, the need and ability to refine and highlight the form through colour and selective application of reflectivity after an initial 3d print.
Site
The up to 60x60cm large objects emancipate themselves from their origin in the digital as well as the traditional craft. Their presence and expression is grounded in the interplay of the filigree of the ornamented ceramic object with light and shadow. We developed the three-dimensional pieces in respect to a figure ground relation: the narrative of the pieces is established in a fine balance of the tuned spotlights above the hovering pieces and the tilted shadow receiving surface.

Reflection on finished work

Criterion 1: Clarity: The appearance of the work is effective. It should be possible to identify the modus operandi, what works, and how it works. Filigree Robotic provides both: traces of the digital manufacturing process (the recognizable algorithmic nature of the pattern across the pieces, the precision and refinement of the work) as the craft (the material expression, the imprecision in the glazing, the impact of the repeated firing in the kiln, which blurs the lines of the clay extrusion). In this way it is a manifest of a new modus operandi between the craftman and the technology it uses.

Criterion 2: Density: The work involves phenomena and structures in contexts that are not established in advance. The ideal of a claybased process is usually that the result can be foreseen, as that it survives the many necessary processes, as the firing. In many cases the material has however its own agency and resists a secure prediction of the outcome. Working and negotiating with these tolerances is the core part of Filigree Robotic and it’s digital environment: the running generative algorithm.

Criterion 3: Depth: The work sets out new rules for the artistic practice and establishes a new framework for interpretation of the surroundings.
Digital Technology enables new expression for design and architecture. Filigree Robotic enriches on the side of technology the repertoire of crafts in clay with 3d feedback (the running generative algorithm) and robotic extrusion of clay (3d printing) and provides a new expression through a material depth and precision and density of detail.

Main Publications

KUV Submission – Flemming Tvede Hansen, IBD