First Robotic Fabrication Unit at ETH: 2005

Gramazio Kohler Research
ETH Zurich
Rethinking Construction

Gramazio Kohler Research
ETH Zurich
Expressive Material Logics
Material Becomes Informed
Robotic Fabrication: Grand challenges

Bespoke Digital Prefabrication

On Site Digital Fabrication
Mesh Mould: Robotically Fabricated Functional Formwork

PhD Dissertation, ETH Zurich 2013 - 2017
Cost Distribution in a Concrete Structure

- Formwork: 53%
- Concrete: 29%
- Reinforcement: 18%

Source: Structure magazine, April 2007

Gramazio Kohler Research
ETH Zurich
Conventional Non Standard Formwork

Formwork of EPFL Rolex Learning Centers

Gramazio Kohler Research
ETH Zurich
Mesh Mould: Funktionale Schalung

Formwork + Reinforcement

Formwork = Reinforcement

Gramazio Kohler Research
ETH Zurich
Phase 1:
Polymer Meshes
Extrusion Process: 80 x speed
Concrete Prototype
Phase 2: Structural Integrity
Fabrication Process: 10 x speed
Double Curved Mesh
Filling Process: Double Curved Mesh
Finishing Double Curved Mesh
Robotic Surface Finish
Out of the Laboratory

EMPA NEST, Dübendorf 2017
Testing Ground: EMPA NEST

Gramazio Kohler Research
ETH Zurich
Testing Ground: EMPA NEST
Testing Ground: dfab house

- Gramazio Kohler Research Timber Unit
- Digital Building Technologies Floor Slab
- Smart Dynamic Casting Facade

- **Mesh Mould Wall**
  - Installations Backbone
  - Base
Construction Start
Thank you for your attention

GRAMAZIO KOHLER RESEARCH