What can you get from LGLS?

1. **Exploration of our mathematical form-finding tools in Grasshopper**
2. **Introduction to a combination of Grasshopper with a professional FEA solution**
3. **Development of design projects in cross-disciplinary teams**
4. **Input and advice from experts in lightweight structures and design**
5. **Mathematical background knowledge for the design with ruled surfaces**
6. **Perfect working conditions and exchange with top researchers from around the world**
7. **Production of scale models in the Makerspace at the SLUB Dresden**
8. **Hot-wire cutting with a Universal Robot UR 10 and a CNC-multitool**
9. **Presentation of your results and prototypes within a cultural and scientific setting**
10. **Excursions to cultural and scientific hotspots of the beautiful city Dresden**

Program

The core program focuses on design projects, which you will develop in small cross-disciplinary working groups during the three weeks of the summer school. The support program will lead you to local research institutes as well as some of the famous cultural institutions of Dresden.

Please refer to the website of LGLS for details:
https://tu-dresden.de/mathematik/lgls

GMV
Geometric Modeling and Visualization

Organizer

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DRESDEN concept

TECHNISCHE UNIVERSITÄT DRESDEN

Line Geometry for Lightweight Structures

International
Summer School 2018
at the TU Dresden
September 10 – 28

Topic

The main objective of LGLS is to design lightweight structures using ruled surfaces. Ruled surfaces play a major role in architecture and civil engineering like in the works of Vladimir Shukhov, Antoni Gaudí, Felix Candela, Santiago Calatrava and many others.

A good reason for using ruled surfaces is that they can be generated quite easily by moving a straight line. This fact already leads to strategies of fabrication like hot-wire cutting of extruded polystyrene for the formwork of concrete shells. On the other hand, ruled surfaces are statically efficient, especially in the case of skewed ruled surfaces, which are very stable due to a generally negative Gaussian curvature. Last not least, most shapes using ruled surfaces are characterized by extraordinary elegance.

LGLS is both a summer school to enhance your knowledge and abilities and a design space exploration of ruled surfaces, especially in lightweight construction applications.

Background

During the recent research project "Thin-walled Concrete Structures with Line Geometry" (2015 – 2018), the teams of Prof. Mike Schlaich (TU Berlin) and Prof. Daniel Lordick (TU Dresden) developed tools and methods for the form-finding and dimensioning of components from ruled surfaces. The goal was to combine a mathematical approach with the requirements of engineering. The strategies were already evaluated during a demonstrator project for a small footbridge, which was presented at the Footbridge 2017 Conference at the TU Berlin.

Acknowledgement

The summer school is funded by the German Research Foundation (DFG) as part of the SPP 1542. Additional funding is made possible by the Excellence Initiative of the German Federal Ministry of Education and Research and again the German Research Foundation.

Venue

The summer school will take place in Dresden, one of Germany's most beautiful cities.
In 2012, Technische Universität Dresden has been awarded the title "Excellence University", indicating it as one of the leading German Universities.
Venue of LGLS will be the spacious Makerspace of the SLUB (Saxon State and University Library in Dresden) on the main campus of the TU Dresden.

Who can attend the summer school?

1. You are a young researcher, PhD student, young professional, postdoc or junior faculty member in architecture, engineering or mathematics?
2. You are already working on a project that deals with ruled surfaces or have interests within the scope of LGLS?
3. You appreciate to do cross-disciplinary work and research in small groups?
4. You want to develop a project from the conceptual phase to prototypes while being advised by experts?

Perfect. We would like to welcome you to LGLS!

Moreover we would like to invite artists to apply. If you are an artist and feel attracted by the scope of LGLS, especially by the topic lightness, please apply. We can provide up to three extra positions for a vibrant exchange of knowledge and experience.

How to apply?

The summer school LGLS is open for a maximum of 20 regular participants. Participants will be supported with a grant for travelling costs and accommodation.

For applying to the summer school and additional information please visit the website:

https://tu-dresden.de/mathematik/lgls

Deadline for applications is Friday, 20th of July, 2018
Acceptance letters will be sent until 27th of July, 2018.

Link of the QR code:
https://tu-dresden.de/mn/math/geometrie/lordick/schnittstelle/veranstaltungen/summer-schools/lgls-2018?set_language=en