

COURSE ON **Computational Geometry**

Prof. Mark Minas - Universität der Bundeswehr München, Munich, Germany

Computational Geometry is about geometric problems and their efficient algorithmic solution on computers. Such geometric problems occur, for instance, in computer graphics, image processing, robotics, geographic information systems etc. But there are also many non-geometric problems that can be interpreted in a geometric way and thus allowing for solutions by Computational Geometry. This course of eight hours introduces into the following two-dimensional problems and their efficient solution using in Computational Geometry:

- Convex Hulls
- Line Segment Intersection
- Linear Programming (in 2D)
- Point Location
- Basic Robot Motion Planning

The course consists of lectures as well as exercises and will be held on four days. On the first three days, there will be exercise assignments which will be discussed at the beginning of the following day.

Dates: 14 – 17 May 2019

Hours: 15:00 –17:00 on Tuesday 14 and Thursday 16
9:00 – 11:00 on Wednesday 15 and Friday 17

Place: Dipartimento di Informatica - edificio F (ex -stecca 7), sezione di fronte edificio F2, II piano, stanza n. 11 (<http://web.unisa.it/vivere-il-campus/unisa-experience/campus-map>)

The course is based on the following book which is highly recommended:

M. de Berg, M. van Kreveld, M. Overmars, O. Schwarzkopf: Computational Geometry: Algorithms and Applications. Third Edition, Springer, Berlin, 2008. ISBN 978-3-540-77973-5, DOI 10.1007/978-3-540-77974-2. <http://www.springer.com/us/book/9783540779735>

Curriculum Vitae

Prof. Mark Minas holds Diploma and Doctoral degrees in Computer Science from the Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany. In 2000, he was awarded the postdoctoral university lecturing qualification (Habilitation) in Computer Science.

He worked at the Friedrich-Alexander-Universität Erlangen-Nürnberg as a research scientist until 2002. In 1993 and 1994 he was a post-doc at the International Computer Science Institute at Berkeley, California.

In 2002, he joined the Department of Computer Science of the Universität der Bundeswehr München, Munich, Germany, as visiting professor. Since 2003, he is a full professor of Computer Science at the Institute for Software Technology. From 2010 till 2014 he has been dean of the Department of Computer Science.

Mark Minas works in the areas of visual languages and graph transformations. He applies concepts of graph grammars in order to specify and generate graphical diagram editors, which may be used with a traditional user interface or using gesture-based and sketch-based interaction. These concepts have been realized in the tools DiaGen and DiaMeta (<https://go.unibw.de/diagen>). Analyzing diagrams based on graph grammars requires efficient graph parsing. Recent work on the tool Grappa (<https://go.unibw.de/grappa>) applies well-known concepts from string parsing to graph grammars, yielding highly efficient parsers.