UNIVERSITÄT SALZBURG
Computational Geometry and Applications Lab

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To all talented graduate students!

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Subject: Funded PhD Studentship or Postdoc in Computational Geometry

A fully funded PhD studentship is available at the University of Salzburg, Austria, in the Computational Geometry and Applications Lab directed by Martin Held. Alternatively, the position can be filled by a postdoc. The earliest possible starting date is 01-April-2018, but a slightly later start is negotiable.

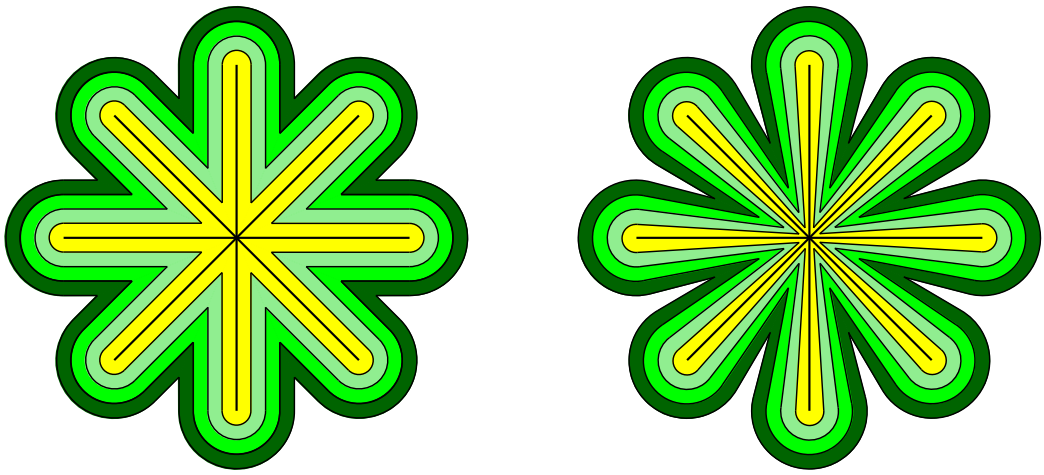
The ideal candidate has knowledge and a background in at least some of the following areas:

- Computational geometry
- GPU computing
- Differential geometry
- Computer graphics
- Programming, in particular C/C++

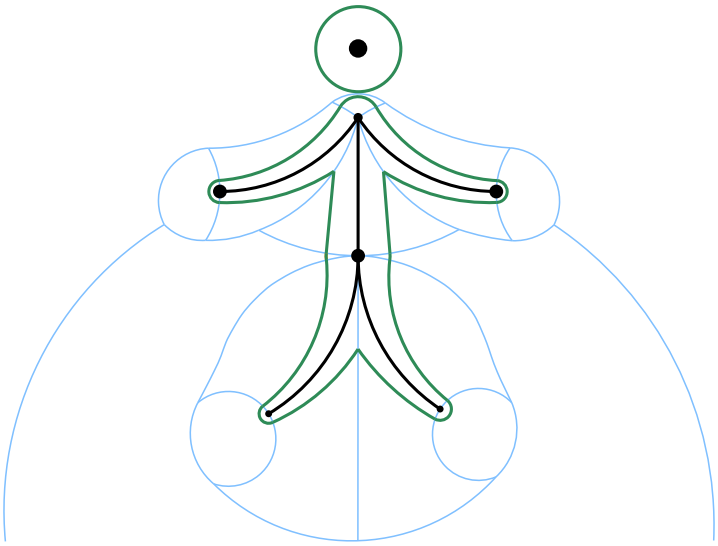
For the PhD student position, candidates must hold a Master's degree (like the Austrian "Dipl.-Ing.", or equivalent) in computer science, mathematics or a closely related field by the starting time. For the postdoc position, candidates must have earned a doctorate by the starting time, and should have publications in top venues in computational geometry, geometric computing or a related field. The work can be conducted in both German or English. In any case, a decent command of English is a must. And, of course, knowing basics of German will make it easier to get around in a predominantly German-speaking environment.

This position is available within a research project funded by the Austrian Science Fund (FWF), and embedded in Martin Held's Computational Geometry and Applications Lab; see `https://www.cosy.sbg.ac.at/~held/work.html`. The PhD student position runs for four years, with the possibility to be upgraded to a postdoc (after having obtained the doctorate) for the last six months of the four-year contract. It follows the FWF salary regulations and comes with a net pay, after tax and with full social security, of roughly(!) €26 000 per year. The postdoc position runs for two and a half years, with a yearly salary (after tax and with full social security) of roughly(!) €41 000. Extra funding to cover travel expenses (e.g., costs of trips to conferences) is available.

The research project that provides the funding deals with generalized Voronoi diagrams and generalized offsetting in two dimensional Euclidean space. In a nutshell, weighted skeletal structures have been used for years as tools for the geometric characterization and efficient computation of constant-radius and mitered offset curves of planar straight-line graphs. Among other applications, such an offset can be used to model the area painted during the movement of an artist's brush if a uniform pressure of the brush is applied. If, however, the artist applies a non-uniform pressure then a so-called *variable-radius offset* corresponds to the area covered by paint, and the currently known algorithms to model standard offsets are no longer applicable.



Our goal is to study the interaction of variable-radius offsets with a skeletal structure which captures their geometry: *generalized weighted Voronoi diagrams*. Roughly, a generalized weighted Voronoi diagram is a generalization of multiplicatively-weighted Voronoi diagrams of point sites, with straight-line segments and circular arcs instead of points as input sites, and with a weight function assigned to every input site that is given by the linear interpolation of the multiplicative weights of the endpoints of the site. Similarly, a variable-radius offset of a site is the envelope of a family of disks centered along the site whose radii vary according to the weight function.



Salzburg itself is a fascinating place that is very popular not just with tourists. It is small enough to make it easy to get around, while being large enough to be able to cater to diverse need. The Austrian Alps and several beautiful lakes are about half an hour to one and a half hours away by car or public transport. Actually, the Untersberg mountain range starts just outside of the suburbs of Salzburg. Similarly, the German metropolis Munich (and its large international airport MUC) is reachable within about one and a half hours by car or train. Please see `https://www.salzburg.info/en/salzburg` for more information on Salzburg.

Questions concerning this offer and applications that include the usual documents — letter of motivation, curriculum vitae, certificates, names and addresses (including email addresses) of two (professoral) references — should be submitted to Martin Held (`held@cs.sbg.ac.at`). Please send your application in electronic form as one single PDF document.

There is no formal application deadline and the position will remain vacant until a suitable candidate has been identified. However, I hope to fill the position by 15-February-2018. Hence, in order for your application to receive full attention it is advisable to apply prior to that date; applications received after that date risk not being considered at all.

I am looking forward to receiving your application!

Martin Held