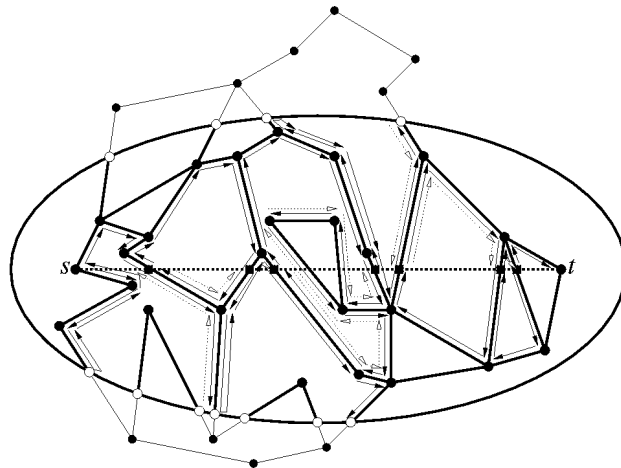


Semester Project “Geometric Routing in Ad-Hoc Networks”

Over the last years, networks of wireless devices have become a very popular object to study. And still, the wireless sector is supposed to be one of the fastest growing ones in the years to come. From an algorithmic point of view, the most interesting application in the field are so called mobile ad-hoc networks, i.e. networks of wireless devices without a common server infrastructure. Since in general, the topology of ad-hoc networks changes rather rapidly, the standard routing algorithms which store large tables are not appropriate. While there are many suggestions on how to do routing in the context of ad-hoc networks, there are no strong theoretical performance guarantees for any of them. Geometric routing is a very special model for mobile ad-hoc routing algorithms which assumes that 1) all nodes are placed in the 2-dimensional plane, 2) all nodes know their geometric position, and 3) the sender of a message knows the geometric position of the destination. For this model, we have recently developed a new routing algorithm (called AFR), which we could show to be asymptotically optimal.



In this semester project you will extend our algorithm AFR such that it performs well also in an average case. On one hand there is AFR which always reaches the destination with asymptotically optimal costs. On the other hand, there are very simple greedy strategies where the delivery is not guaranteed but which appear to be much better for some typical networks. The task of this project is to combine AFR with other algorithms such that the resulting routing algorithm keeps the good properties of both parts (good performance for typical networks and asymptotically optimal worst-case behavior).

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