

Prof. Roger Wattenhofer

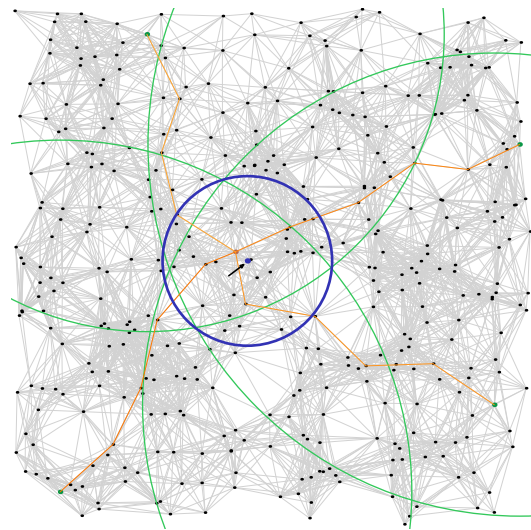
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Diploma/Master's Thesis “Virtual Coordinate Simulation”

Most researchers ultimately envision sensor networks as “smart dust.” This means that each sensor node is a tiny device with limited computing and communication power. On the other hand, applications require nodes to know their location in order to attach coordinates to the sensed data. At the current state of the art, however, GPS receivers are much too big and heavy for our little nodes. Thus researchers have been looking into the possibility of distributively computing the positions of all the nodes in the network based on the actual coordinates of just a handful of so-called anchors. For some applications, anchors are not even necessary and we want to compute *virtual coordinates* of the sensor network which accurately reflects the topology.



A plethora of algorithms to compute virtual (or absolute) coordinates have been proposed in the literature, but none which provide any guarantees for the quality of the estimated positions or sometimes even the runtime of their algorithms. Your task will be to simulate a number of these algorithms in order to provide a first real basis of comparison. If time and interest permit, you can even try to analytically prove the results you have found experimentally.

Skills

- Experience with programming in Java, interest in algorithms

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