



*Ph.D. programme
in Mathematics and Computer Science*

Title: A Trajectory Calculus for Partitioned Maps

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Abstract:

As GPS-enabled devices proliferate, location-based services become all the more important in social networking, mobile applications, advertising, traffic monitoring, and many other domains. Reasoning about the locations and trajectories of people, vehicles and so on must be efficient and robust, since this information must be processed online and should provide answers to users' requests in real time. We propose three versions of a trajectory calculus based on the allowed properties over trajectories, where trajectories are defined as a sequence of non-overlapping regions of a partitioned map. More specifically, if a given trajectory is allowed to start and finish at the same region, 6 base relations are defined (TC-6). If a given trajectory should have different start and finish regions but cycles are allowed, 10 base relations are defined (TC-10). Finally, if no cycles are allowed, 16 base relations are defined (TC-16). Composition tables are defined for all three versions. An implementation in ASP is currently underway and experimental evaluation of reasoning performance is to be conducted based on real datasets.