Open Problems Session

3 November 2008 / Minutes taken by Rob Weibel

Andrew Frank
Sharing 3-D data sets: What is the format for a moving object data set that you could produce and someone else could use? What do we mean by moving objects?

- How are attributes of an MO that are changing over time represented?
- Stefano Spaccapietra → How is the extent and configuration of an MO represented? (There is no such thing as a moving point; this is just an abstraction.)
- Chris Gold → Scale issues: At a global scale, a ship can be approximated as a point. At the local scale, for collision detection with obstacles, the exact geometry 3-D has to be known.
- Wilko Quak → Positioning accuracy: How is it represented? It may change over time.

Natalia Andrienko:
How are clusters of trajectories represented? How are they aggregated? → There may be 'bundles' that may converge and then branch again.
→ Gudmundsson, Speckmann: You have to define the distance metric that you use for clustering, e.g. Frechet distance
→ Weibel: Is there no spatial reference that you could match against, such as a road network?
→ Sack: What's wrong with finding a trajectory that minimizes a certain distance to all others?
→ Purves: You need to know about the semantics before you can do any interpretation, such as similarity matching.
→ Buchin: You should first decompose into sub-trajectories.
→ Sester: How about discretizing the trajectories?
→ Dodge: Rather than computing similarity 2-D and 3-D, you could try doing that in a multidimensional space, using positional attributes and also derived movement parameters such as speed, direction etc. → The question is then, what distance metric can we use? All attributes/dimensions are not equal.
→ Speckmann: Where's the problem? Just use the right distance metric.

Christian Heipke
How much context is needed? What is the right 'amount' of context to solve a given question and infer behavior of an MO?
→ Frank: More generally, if you are capable of simulating the behavior of an object, are you also capable of doing the inverse and find out the paramters that were used to drive the simulation?

Ross Purves
Rephrases the question: What data about context are needed to be able to answer any questions about the behavior of an MO? If we only have x/y/t data, there is just no way we can make any inferences about the behavior of an MO.
→ Weibel: Can we rephrase this into an even more general research question?

Chris Gold
How do we define 'clouds' or 'containers' of moving objects that form some sort of flock and then split again etc.?