

An Object-Oriented Data Model for Moving Objects -

OO-HERMES Data Model

(MSc Thesis Extended Abstract)

Zeha Ageliki

Laboratory of Information Systems
Department of Informatics, University of
Piraeus, Hellas
URL: <http://isl.cs.unipi.gr/db>

October 2007

The last decade lots of different models have been introduced trying to support modeling, designing, constructing and querying databases with spatial data that also include somehow the dimension of time. An interesting category of these models are based on the object relational paradigm and extend legacy object-relational data base management systems (ORDBMS) with spatio-temporal semantics. This thesis proposes a model (OO-HERMES) specific for Moving Object Databases (MOD), as a special case of the spatio-temporal databases, following the object oriented paradigm and develops the appropriate programming constructs as to support MOD persistence in JAVA.

The OO-HERMES model (i.e. the object-oriented variant of the HERMES model) combines spatial and temporal data types for the definition of moving objects data types. The model pays particular attention in extending well known concepts of object orientation for MOD. Characteristic examples include:

- *Relations*, semantic relations that interconnect the moving types of the model, such as *realisation*, *association* and *aggregation*.
- *Operations*, different types of MOD-related operations for query resolving (e.g. identify historic movement properties by determining a certain time instance or time period).
- *Inheritance*, the model supports the interface inheritance which gives the possibility to the moving object types to inherit properties and methods.
- *Polymorphism*, the model is designed in a manner that it gives the possibility of creation of operations that can be used by all the types, while at the level of each type it is possible to create operations that can have the same name but different attributes (*technical overloading*).