

# ECSE 539

## Final Project Demo

### Bixi Language

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# Objective Domain - Bixi System

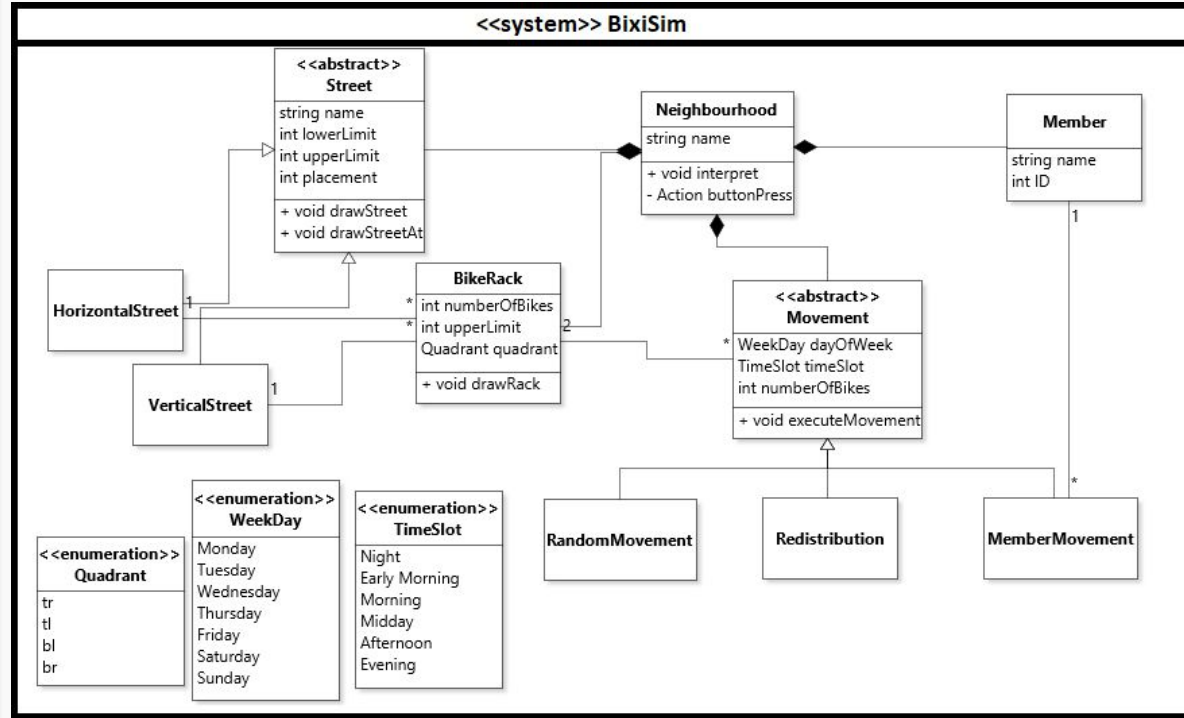


- A way to **model the movements of bicycles** and **evaluate their redistribution** within a neighbourhood;
- Highlight the potential flaws of any given model;
- Random elements are used to rigorously test these models.

# Bixi Language Metamodel

Selected Design Choices:

- Abstraction of *Street* class;
- The 6 potential values of the *TimeSlot* enumeration;
- Abstraction of *Movement*, and specializations of its subclasses;
- Bike Racks must be located at an intersection.



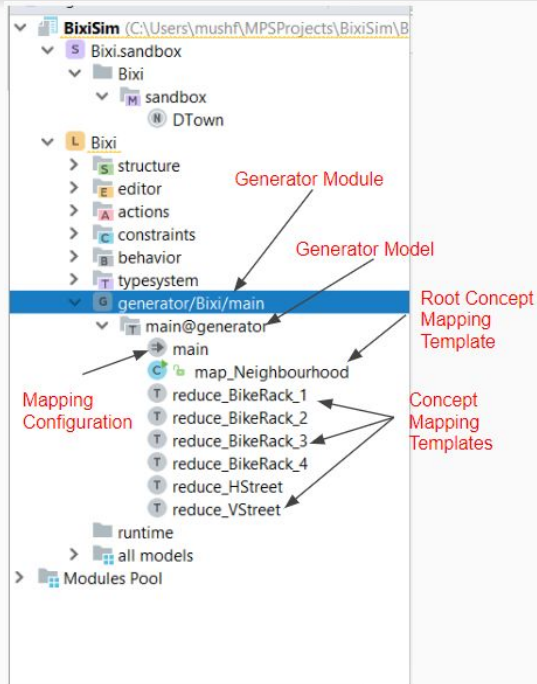
# Language Engineering and Transformation Environment

## JetBrains MPS

- A projectional editor which operates directly on the *Abstract Syntax Tree (AST)*;
- Allows editing of AST through provided modules:
  - Structure;
  - Editor;
  - Constraints;
  - Behaviour;
  - Generator;
  - And many more...



# Semantics



- The **semantics** of a DSL are defined **operationally** using the **Generator Module**;
- MPS follows the **model-to-model transformation** approach, with semantics defined **operationally**;
- **Translated our DSL to java swing** application to run our simulation for the Bixi Domain.

# Live Demo

- Demo of an example model simulation;
- Show an existing program using the language and execute it;
- Bring changes to the model;
- Show how the Bixi language is built, and how it executes.

