

3th Home Assignment – Behavior Modeling

Runtime creation of train lines

Clients can request new train routes between two or more stations that the operators need to accept using the Scheduling Manager. One of the key features of our *Smart Transportation System* is that it can dynamically populate the existing routes with lines at runtime according to the current number of passengers and cargo transportations. When a line becomes overloaded on a specific route, the Smart Train Controller tries to add additional lines on the same route in a different time slot. To start a new line, there should be at least one free train, and the stations on the route need to have free time slots with enough time for getting on/off the train. The Smart Train Controller is also responsible for routing the trains between stations and that the schedule is kept. Each request needs to be fulfilled immediately when the preconditions are satisfied.

Tasks

Based on the initial model and the structural components developed during the 2nd Home Assignment, complete the following tasks:

- a. Design well-detailed Activity Diagrams to describe requesting and creating routes and modifying lines.
- b. Design State Machines that describe the behavior of the Smart Train Controller and Scheduling Manager.
- c. Design Interaction Diagrams that describe the interactions between Smart Train Controller and Scheduling Manager.
- d. Validate the previously designed behavioral models from tasks a), b) and c) (Activity Diagrams, State Machines, Interaction Diagrams) using the Cameo Simulation Toolkit.