A Model-driven Alternative to Programming in Blocks using Rule-based Transformations

Huseyin Ergin
Wenjun Shi
Herart Dominggus Nurue
Jeff Gray
We have a problem in MDE!
Can you help me to catch the naughty pig? Stack a couple of "move forward" blocks together and press "Run" to help me get there.

Blocks

- move forward
- turn left
- turn right
- when run
- move forward

Workspace: 2 / 3 blocks

- repeat 5 times
  - do
- repeat until
  - do
- if path to the left
  - do

Need help? See these videos and hints

Maze Intro
Model-driven Engineering + Core vision
• Similarity to BBPLs

Key characteristics of a possible alternative MDE environment: #1
• Visual

Key characteristics of a possible alternative MDE environment: #2
• Declarative model transformation

Key characteristics of a possible alternative MDE environment: #3
• Easy for first-timers/early-learners

Key characteristics of a possible alternative MDE environment: #4
• Web-based

Key characteristics of a possible alternative MDE environment: #5
A new block-based programming environment using MDE
Metamodel of the Bird Maze World

Concrete Graphical Syntax

A new block-based programming environment using MDE
A new block-based programming environment using MDE
For more examples, please see: https://bit.ly/mde-blocks

Maze 1 solution with built-in rules modeled
CS Education

MDE

A research vision
• Empirical and evidence-based pedagogy
• Minimizing the footprint of the MDE tools
• Student customization of worlds (new metamodels)
• Alternative transformation approaches
• Puzzle structures and progressive learning
Questions?