Towards Making Block-based Programming Activities Adaptive

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Motivation

- introductory block-based programming
- Hour of Code style activities, millions of students
- typically fixed sequence of levels

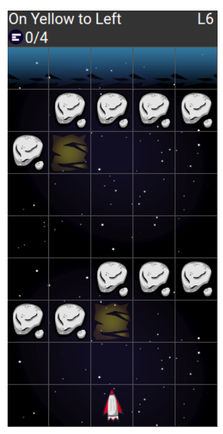
Goals

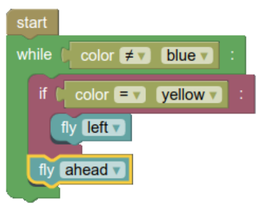
- interesting programming game
- wide range of problem difficulties
- adaptive behaviour

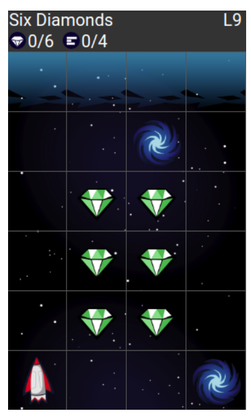
RoboMission Game

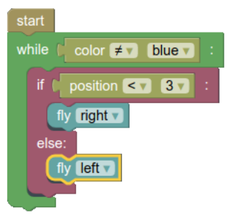
- shooting, collecting diamonds, wormholes
- repeat, while, conditions (colors, position)
- **implicit movement forward**

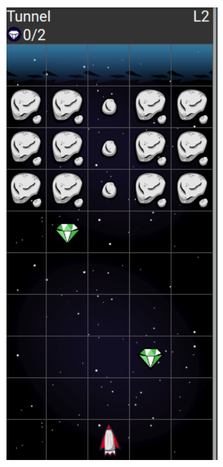
the main innovation compared to similar activities

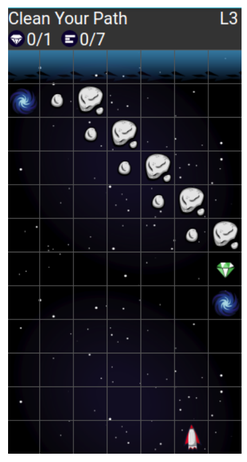








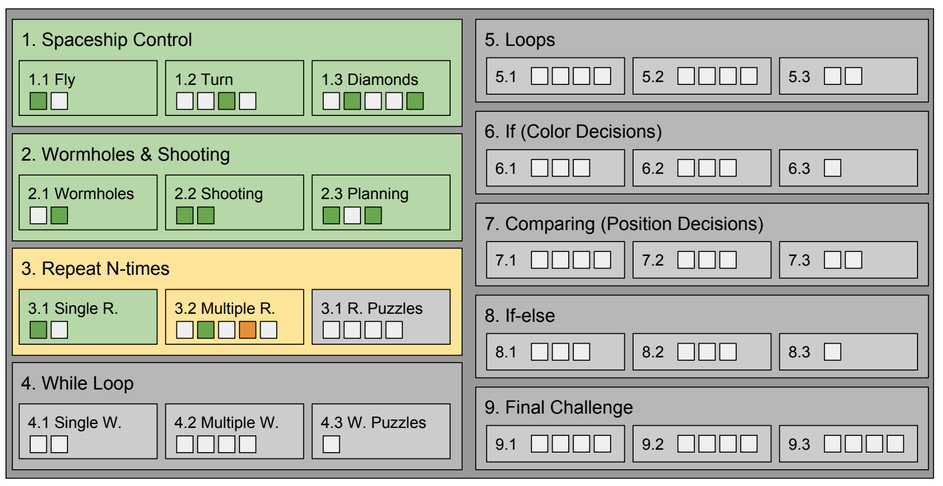




Adaptivity

current version:

- hierarchical levels, sequential ordering
- random choice within a level
- mastery criterion for levels



future work:

- hints, scaffolding
- Q-matrix, concept mapping
- forgetting, repetition

Performance Evaluation

Quantifying student performance over a single problem:

- problem solving time? *currently used*
- number of code submissions?
- number of (unnecessary) edits?
- specific path towards a solution?

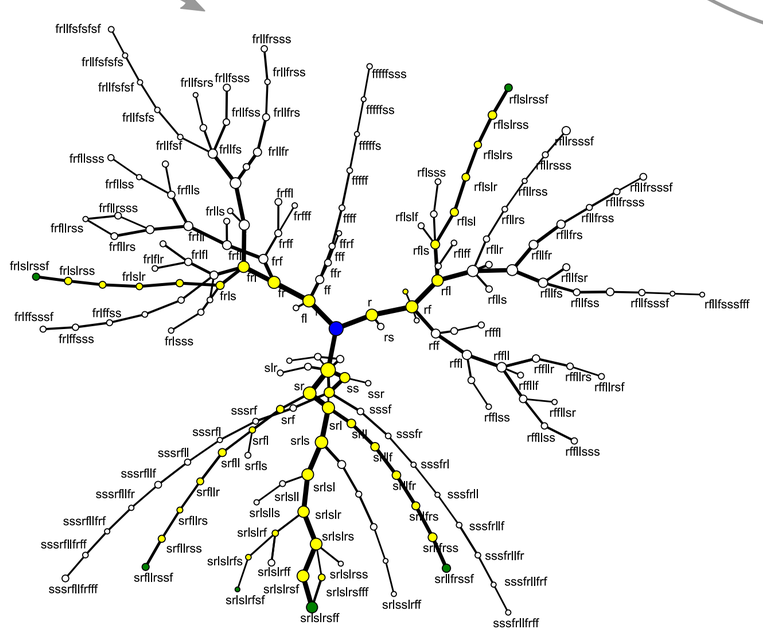
future work:

- relations among measures
- impact on adaptive algoritms

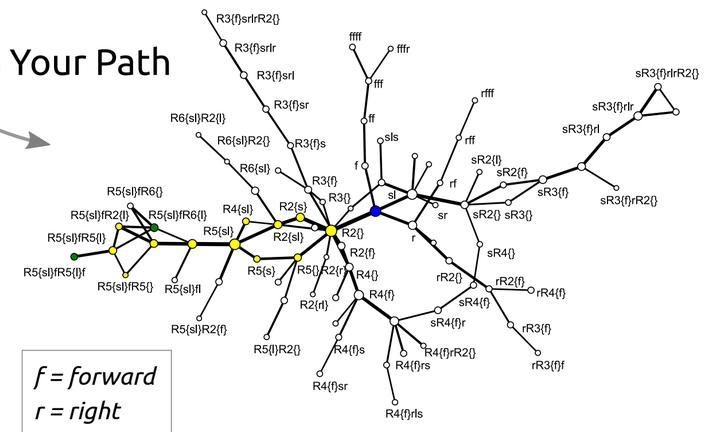
Interaction networks

code snapshots after each edit

Tunnel



Clean Your Path



f = forward
r = right
l = left
s = shoot
Rx = repeat

Adaptive Learning

Research group, Masaryk university Brno

www.fi.muni.cz/adaptivelearning/