Code Lab

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Visualizing your science

1 Introduction

Programming is introduced this fall as a mandatory course in all primary and secondary schools in Great Britain. In countries such as Estonia programming is already a part of the curriculum, and by 2016 Finland has plans to introduce it as well. Through foundations such as Code.org in the US, schools are offered free courses in programming. In the list of backers in the Code.org foundation we find Bill Gates the founder of Microsoft and Mark Zuckerberg the CEO of Facebook. Unfortunately there are no plans of introducing programming in the curriculums in schools in Norway. Lær kidsa koding (LKK) is volunteer organization that wants to help schools in introducing programming as a part of their teaching. LKK has teaching material in Norwegian that can be used by educators to teach children the fundamentals of computer programming.

For teaching programming to children there exists a plethora of different systems and tools. For the youngest kids, a popular alternative is Scratch[1], where kids use a visual programming language where they can make games and other small projects. For older kids a popular choice is to go into game modding, specifically modding the popular video game MineCraft[2]. CodeCombat[3] is another alternative where kids program game characters through labyrints or different set of tasks. If kids want a more hands-on approach it is popular to program either Lego Mindstorms[4] or small Arduino computers[5].

1. scratch.mit.edu
2. minecraft.net
3. codecombat.com
4. mindstorms.lego.com
5. arduino.cc

2 Code Lab

Code Lab is a game where kids collaborate on navigating a character through labyrinths, solving puzzles and fighting enemies. It runs in a shared environment where kids physically interact with the game by either writing real code or moving visual code blocks. Code lab consists of two types of devices, one large display to run the game on, and one or more input devices for kids to interact with the game.

Since the kids need to program the characters to perform different tasks, they will have to learn the basics of programming. The different levels will require them to learn about *variables*, *functions* and *control statements* such as *for*-loops and *if*-statements.

2.1 The Tromsø Display Wall

Since I am a Ph. D. Student in the High-Performance Distributed Systems (HPDS) group at the Department of Computer Science, I plan on developing the game for this course. I plan on using the Tromsø Display Wall lab for the shared environment.

The Tromsø Display Wall consists of 28 computers each connected to a projector. These projectors are mounted behind a canvas, projecting their content onto this canvas. Together the projectors make up a display that has a resolution of 7168x3072, and a physical size of 6x2m. The display wall is used for recruitment of high-school students, but hopefully if this game is completed also in the local teaching activities for the local Kodeklubb coordinated by LKK Tromsø[6].

6. facebook.com/LKK.Tromso