



# Coding Pirates

Teaching kids programming, IT-creativity and  
modern tech

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# Overview

What is Coding Pirates?

Who are Coding Pirates?

Motivation

The Coding Pirates philosophy

Coding Pirates in practice

Scratch

Showcase of projects

Difficulties ahead

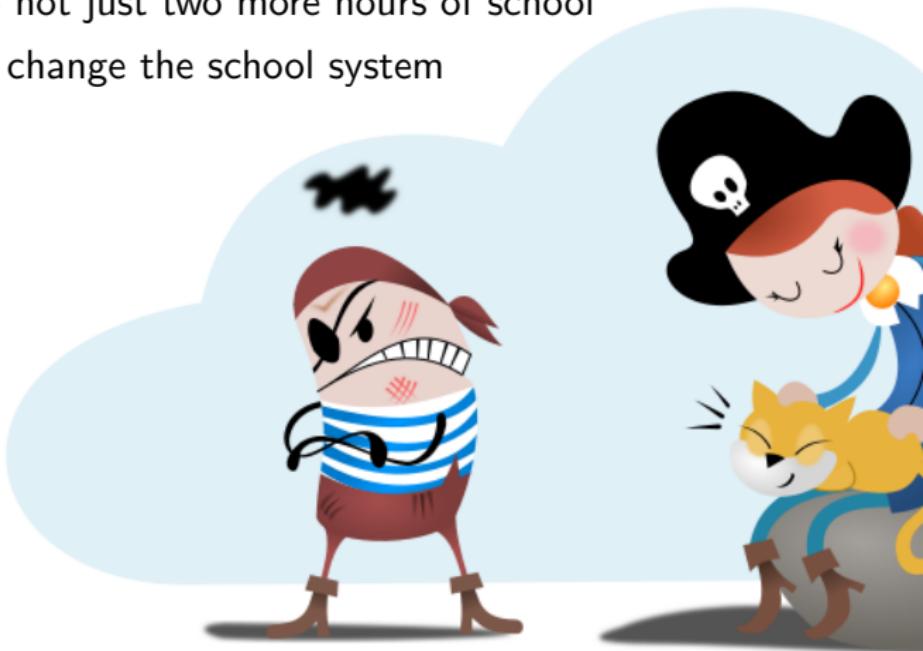
The Coding Pirates Community

Computing in schools

DIKU's involvement

# What is Coding Pirates?

- ▶ Activity for kids aged 7-17 years
- ▶ A playground - not just two more hours of school
- ▶ An attempt to change the school system



# Who are Coding Pirates?

- ▶ Non-profit organisation
- ▶ +250 volunteers in Coding Pirates network
  - ▶ Teachers, IT professionals, researchers, librarians, IT students
- ▶ ~700 paying members
- ▶ 24 hubs in Denmark
- ▶ additional 6 hubs from January 2016



# Partners

- ▶ Center for Teaching Development and Digital Media, Aarhus University
- ▶ Department of Computer Science, University of Copenhagen
- ▶ The libraries
- ▶ Microsoft
- ▶ Computerworld
- ▶ The Danish IT Industri Association
  - ▶ Canon
  - ▶ CapGemini
  - ▶ NNIT
  - ▶ ...

# Motivation

- ▶ Digital revolution, Information Age.
- ▶ Democracy: New tech requires new policies. The public should be able to make informed decisions
- ▶ Automatisation
- ▶ Big IT projects ⇒ big problems! Decision makers needs an upgrade
- ▶ Computational thinking is useful everywhere!
- ▶ Because it's 2015!

# Motivation

- ▶ Digital re
- ▶ Democracy should b
- ▶ Automat
- ▶ Big IT p upgrade
- ▶ Computa
- ▶ Because

**UGEBREVET A4** Navnehjulet Sektioner  

AUTOMATREAKTION

## Robotter og computere snupper en tredjedel af vores job

Af Michael Bræmer | @MichaelBraemer  
Maria Jeppesen | @MariaJeppesen  
Onsdag den 4. november 2015, 05:00

Del:

Mindst 800.000 job på det danske arbejdsmarked bliver automatiseret i løbet af de næste 20 år, viser nye analyser. Fagbevægelsen er alarmeret og efterlyser en massiv opkvalificering.

public  
s needs an

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# Motivation

- ▶ Digital revolution
- ▶ Democracy should be public
- ▶ Automation needs an upgrade
- ▶ Big IT problems. Decision making
- ▶ Computational thinking is useful everywhere!
- ▶ Because it's 2015!

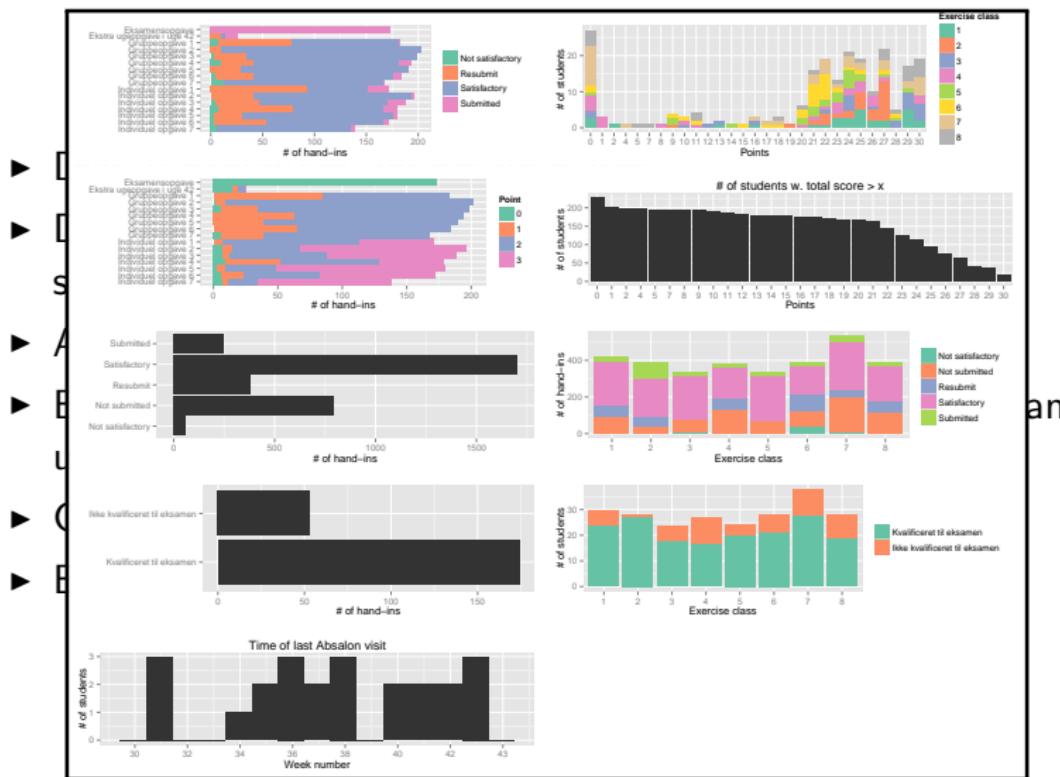
The screenshot shows a news article from the Danish newspaper Politiken. The header includes links for 'SEKTIONER', 'SØG', 'DIT POLITIKEN', and 'MERE'. The main headline reads 'Skat må lægge gæld for 34 milliarder kroner på hylden' (The state must put 34 billion kroner of debt on the shelf). Below the headline is a sub-headline: 'Næsten halvdelen af gælden til det offentlige er nu stemplet ikkeinddrivelig og dermed i praksis umulig at kradse ind. På et år er håblos gæld steget med 5,7 milliarder kroner.' At the bottom of the article, there are social media sharing buttons for 'Gem' (Save), 'Følg' (Follow), and 'f' (Facebook), along with other icons.

MICHAEL OLSEN ▾

# Motivation

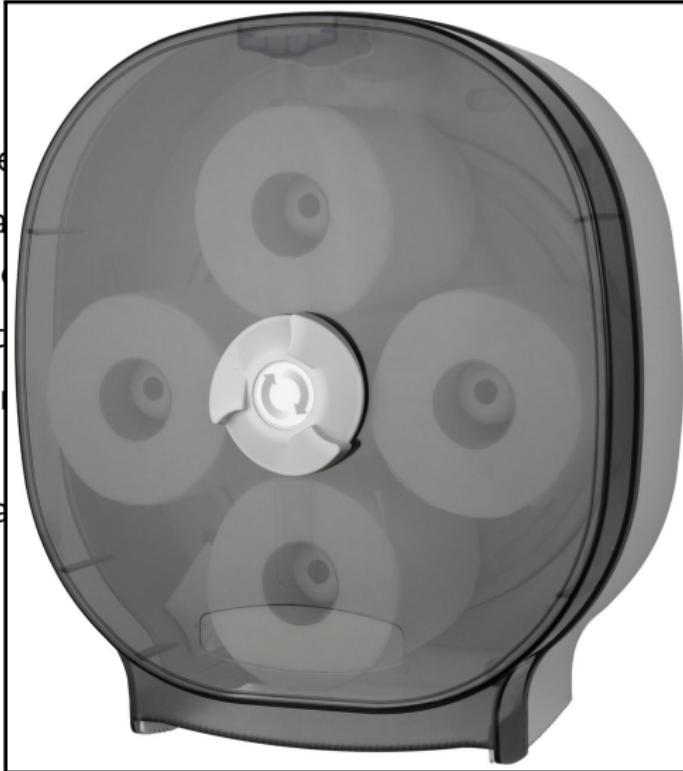
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# Motivation



# Motivation

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- ▶ Democracy  
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- ▶ Because



public  
needs an

# The Coding Pirates philosophy

- ▶ Inspiration from Maker-movement
- ▶ Design thinking
- ▶ Curiosity, exploration
- ▶ Courage, Zest
- ▶ Computational thinking

Manifesto: <http://codingpirates.dk/manifesto/>

*"The problems now faced by mankind are largely due to man's own creativeness. Creativeness will need to account for much more if present problems are to be transcended with solutions".*

*- Preface of "Explorations in Creativity", Editors:  
Ross L. Mooney, Taher A. Razik*

# Example project: Horror teddy bear

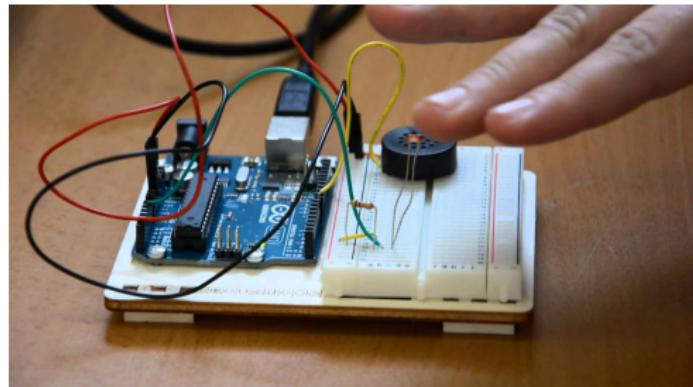
by Penelope, 12 years



<https://www.youtube.com/watch?v=Mc21BbiUGxU>

# In practice

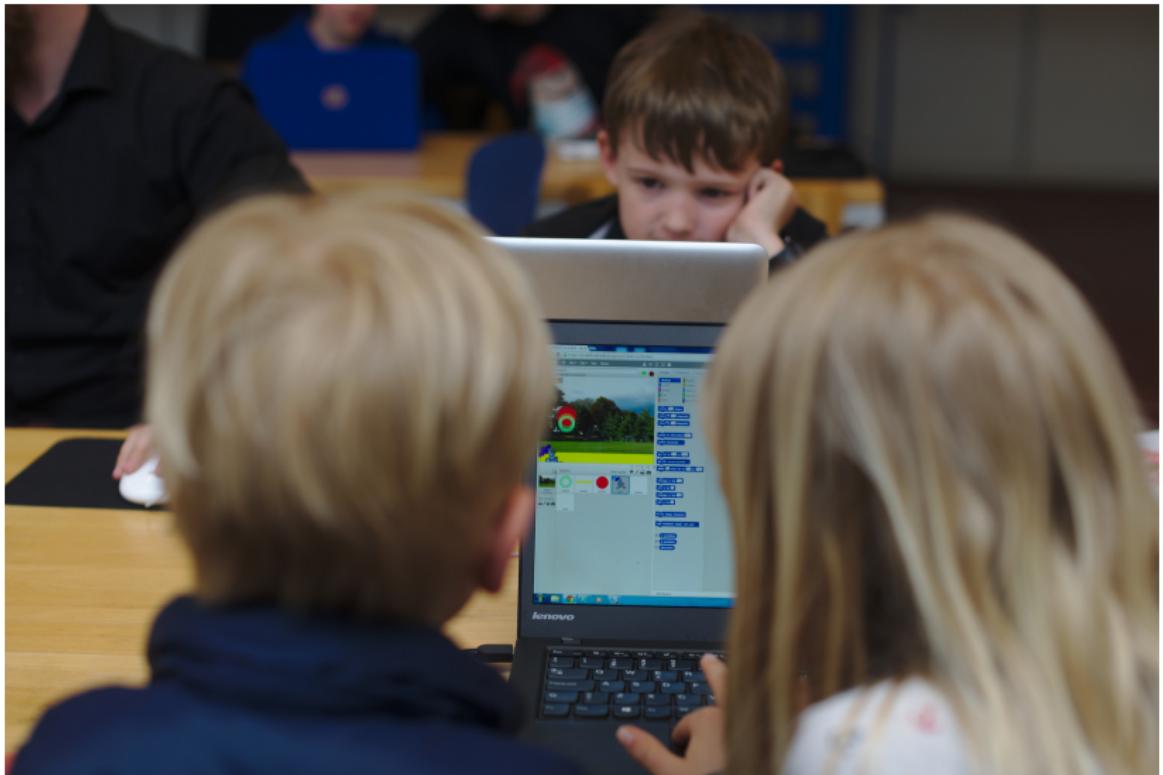
- ▶ ~25-30 kids
- ▶ ~7-10 volunteers
- ▶ 2 hours a week, usually 17:00-19:00
- ▶ 15 minutes break with snacks, cool aid, fruit etc.
- ▶ Bring your own device (BYOD)



# Workshops

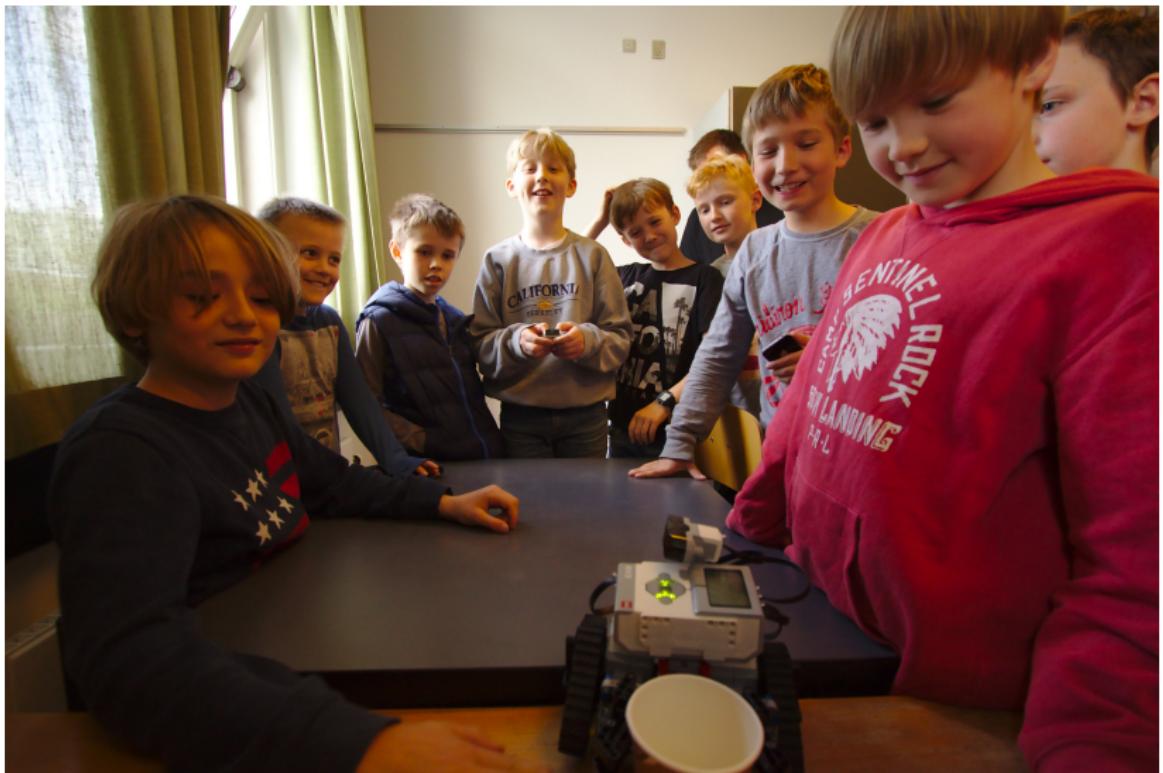
- ▶ 4-6 week workshops
  - ▶ Scratch
  - ▶ Processing(.js)
  - ▶ Arduino
  - ▶ Unity
  - ▶ Python
  - ▶ 3D modelling in Blender
- ▶ Kids can not switch between workshops during these 4-6 weeks
- ▶ Presentations at the end of a 4-6 week period













# SCRATCH

# Stickman dungeon

by Alexander and Oscar, 11 years



<https://scratch.mit.edu/projects/57201286/>

# Robot-sumo



<https://www.youtube.com/watch?v=qcWTpXh-r0w>

# 3D printed autonomous Arduino boat

by Niels, 12 years

<https://www.facebook.com/pastaofficiel>

PASTA - Tiny Autonomous Boat



**PASTA - Tiny Autonomous Boat**  
Community

Liked Mess

**Timeline** About Photos Likes Videos

41 people like this  
Niels N. Horn and 3 other friends

Invite friends to like this Page

**ABOUT**

Pirately Autonomous Ship Travels Anywhere (PASTA).  
Follow the creation of PASTA, from being just af HIPS (plastic) boat, to being an autonomous boat!

Ask for PASTA - Tiny Autonomous Boat's website

**PHOTOS**

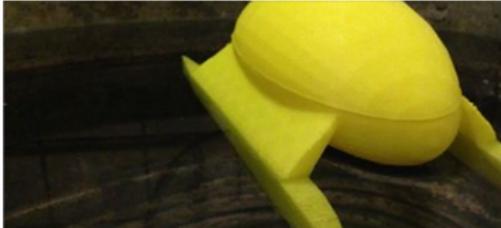


**Status** Photo/Video

Write something on this Page...

PASTA - Tiny Autonomous Boat added 3 new photos.  
8 November 2014 · Edited ·

Just floating around.



# iOS app: “Draw the wall”

## by William, 14 years

### Draw the Wall

By joachim kattrup

Open iTunes to buy and download apps.



[View in iTunes](#)

This app is designed for both iPhone and iPad

#### Free

Category: Games

Released: Aug 07, 2015

Version: 1.0

Size: 35.2 MB

Language: English

Seller: joachim kattrup

© 2015 William Kattrup

Rated 4+

**Compatibility:** Requires iOS 7.0 or later. Compatible with iPhone, iPad, and iPod touch. This app is optimized for iPhone 5, iPhone 6, and iPhone 6 Plus.

#### Customer Ratings

We have not received enough ratings to display an average for the current version of this application.

#### More by joachim kattrup

[View More by This Developer](#)

### Description

Draw the Wall is a simple minimalist game.

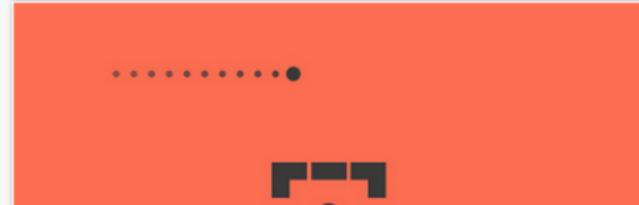
Fun to play, hard to win.

Draw the walls and make the ball go to the hollow circle.

[Draw the Wall Support](#)

### Screenshots

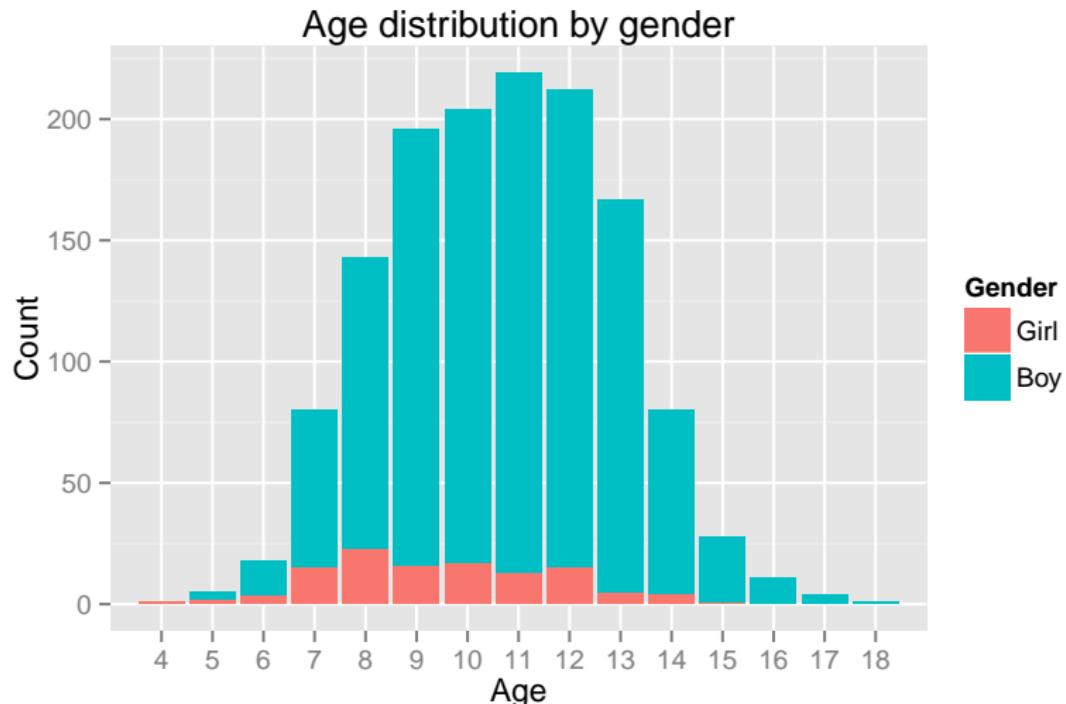
[iPhone](#) | [iPad](#)



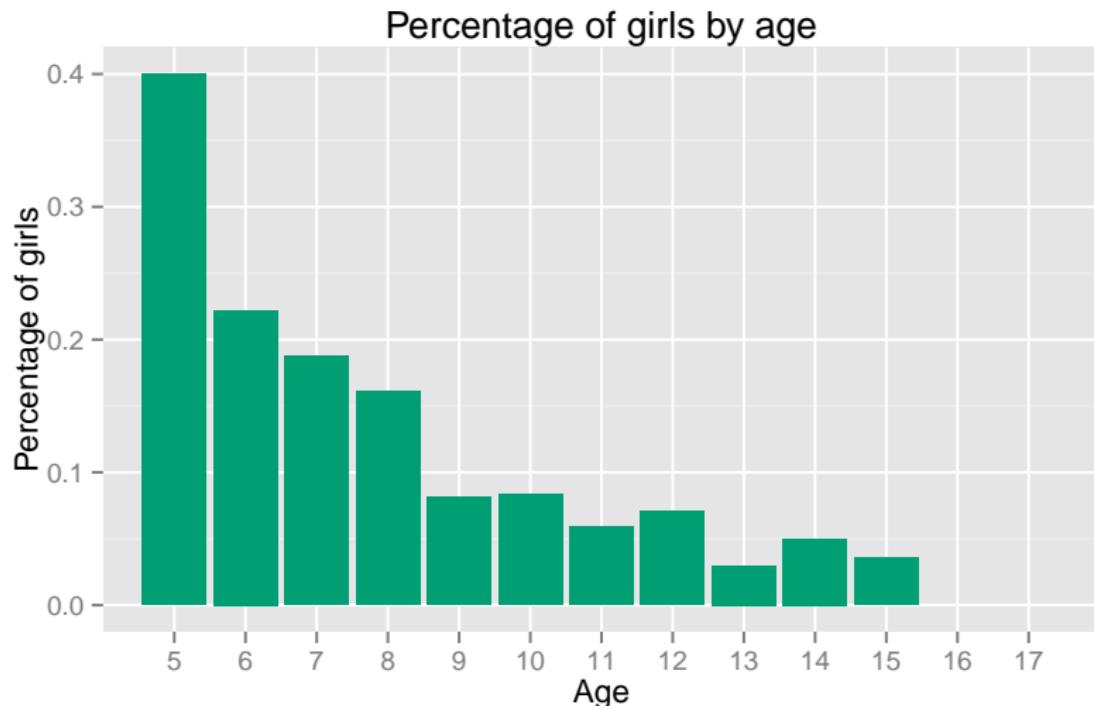
# Difficulties

- ▶ Few from age 14 and up
- ▶ Few girls
- ▶ Fostering friendships is hard, but important
  - ▶ Force pair programming?
- ▶ Further education of volunteers

# Age and gender (including waiting list)



# Percentage of girls by age (including waiting list)



# Volunteer community



# Computing in schools

*"The computer is the Proteus of machines. Its essence is its universality, its power to simulate. Because it can take on a thousand forms and can serve a thousand functions, it can appeal to a thousand tastes."*

*- Seymour Papert, in Mindstorms*

We can already use this when teaching e.g. history, biology, chemistry, or language classes!

- ▶ Make a game that teaches grade  $N - 1$  about photosynthesis
- ▶ Make a game that teaches grade  $N - 1$  about life in ancient Rome
- ▶ Make an interactive story that tells the story XYZ

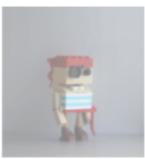
More fun than a poster or a written report!

# But what do we want schools to teach?

- ▶ Teach computing as a discipline, e.g. like math
  - ▶ Algorithms vs. data
  - ▶ Systematic problem solving
  - ▶ Computational thinking
- ▶ Teach computing as a craft/skill, e.g. like woodwork
  - ▶ Focus on creation and tools
  - ▶ Creative and reflective thinking
- ▶ A mix?
- ▶ As a separate discipline or inside other classes?

# Why does a university use time teaching tweens and teens?

- ▶ Supply chain management
- ▶ The teachers needs our expertise
- ▶ Defining how computing should be taught in Schools
- ▶ Potential research areas
- ▶ Teacher education and re-education
- ▶ Because we have connections to potential volunteers (e.g. alumni)
- ▶ Good publicity and great advertisement



## Coding Pirates

**DKK220.00 Inc. VAT**

Coding Pirates er en forening, hvis formål er at udvikle børn og unges IT-kompetencer og kreativitet. Vi søger at give børn et dybere kendskab til computere, robotter, programmeringssprog, design samt spiludvikling og derved ruste dem til at blive fremtidens produktudviklere.

Vores forening har afdelinger over hele landet, og vi afholder et væld af aktiviteteter – klubaftener, workshops, konkurrencer, online kollaboration og udarbejdelse af undervisningsmateriale. Vi giver altså børn et tilbud om at gå til teknologi på samme måde, som man kan gå til fodbold og andre sportsgrene.

Ved at købe denne flotte model af vores maskot Kaptajn Hack støtter du Coding Pirates' videre arbejde, og du bliver samtidig en del af Brickbacker-fællesskabet!

You won't be charged unless the goal is reached

11 sold towards goal of 50

34 / 36

# Coding Pirates in Gothenburg?



# Links

- ▶ Website: <http://codingpirates.dk>
- ▶ Facebook: <https://www.facebook.com/codingpirates>
- ▶ Manifesto: <http://codingpirates.dk/manifesto/>
- ▶ Scratch labyrinth:  
<https://scratch.mit.edu/projects/55351416/>
- ▶ Brickbacker: <http://brickbacker.com/product/codingpirates/>
- ▶ DigiPippi: <http://digipippi.dk>