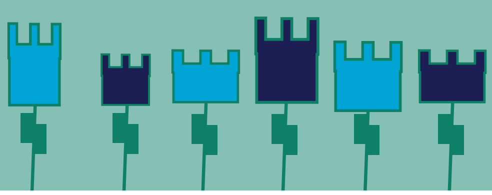
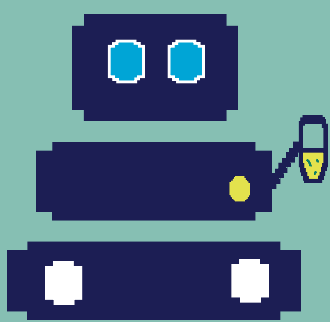
APSCE CTE-STEM

6TH APSCE INTERNATIONAL CONFERENCE ON COMPUTATIONAL THINKING AND STEM EDUCATION 2022

PROGRAM BOOK





ORGANISED BY:

Asia-Pacific Society for Computers in Education

HOSTED BY:

Centre for Education and Learning
Leiden-Delft-Erasmus Universities

TU Delft

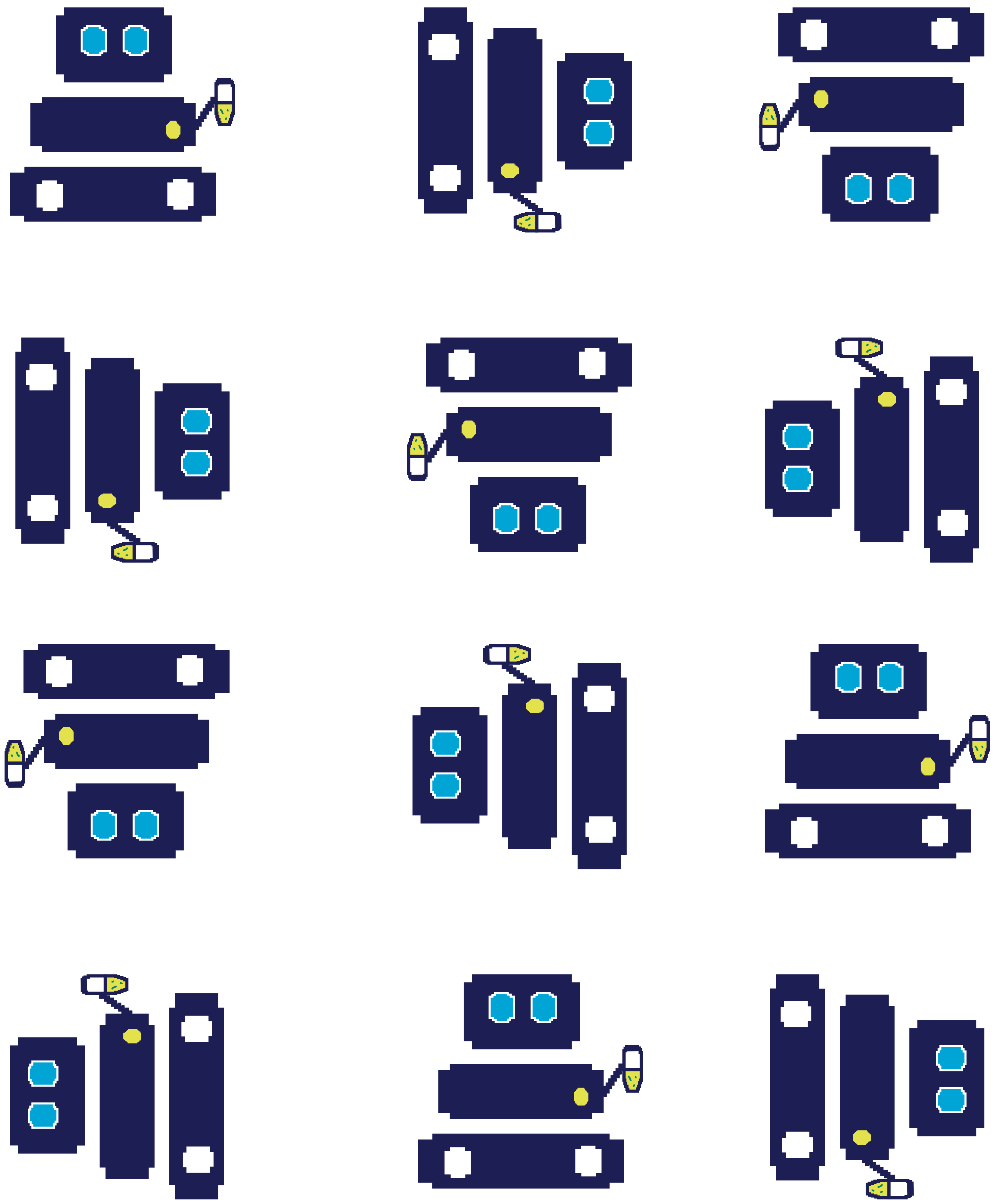
SUPPORTED BY:

EATEL

ONDERWIJS NETWERK ZUID-HOLLAND BETA

zhaw Life Sciences and Facility Management
Institute of Computational Life Sciences

Open Universiteit



CONTENTS

CONTACT INFORMATION

IN CASE YOU HAVE EMERGENCY QUESTIONS YOU CAN CALL:

SYLVIA WALSARIE WOLFF
+316 41 28 12 91

IN ANY OTHER CASE YOU CAN CONTACT US TROUGH:

CTE-STEM2022@TUDELFT.NL

OVERVIEW PROGRAM

TIMEZONE AND TIME		DAY 1: 15 JUNE (WED))	DAY 2: 16 JUNE (THUR)	DAY 3: 17 JUNE (FRI)
UTC+2 | CET	UTC+8 | ASIA	EVENT	EVENT	EVENT
09:00 - 09:45	15:00 - 15:45	OPENING CONFERENCE	KEYNOTE: JENS MÖNIG	KEYNOTE: MAARTEN DE LAAT
09:45 - 10:00	15:45 - 16:00	COFFEE BREAK	COFFEE BREAK	COFFEE BREAK
10:00 - 11:30	16:00 - 17:30	SESSION 1: PAPER PRESENTATIONS	SESSION 3: PAPER PRESENTATIONS	SESSION 5: PAPER PRESENTATIONS
11:30 - 12:00	17:30 - 18:00	LUNCH BREAK 1	LUNCH BREAK 1	LUNCH BREAK 1
12:00 - 13:30	18:00 - 19:30	SESSION 2: PAPER PRESENTATIONS	SESSION 4: PAPER PRESENTATIONS	SESSION 6: PAPER PRESENTATIONS
13:30 - 14:00	19:30 - 20:00	LUNCH BREAK 2	LUNCH BREAK 2	LUNCH BREAK 2
14:00 - 14:45	20:00 - 20:45	KEYNOTE: GEORGI DIMITROV	KEYNOTE: MATTI TEDRE	CLOSING CEREMONY
14:45 - 15:00	20:45 - 21:00	COFFEE BREAK	COFEE BREAK	
15:00 - 17:00	21:00 - 23:00	WORKSHOPS: • FLUIGO • RONALD KLEMKE • TEXAS INSTRUMENTS	WORKSHOPS: • PERL: HEDY • HANNO VAN KEULEN • NARDIE & CHRSTIAN	
18:30	23:30		DINNER AT THE BEACH	

KEY NOTES

TITLE OF KEYNOTE:
WHAT DOES IT MEAN TO BE DIGITALLY COMPETENT TODAY AND WHAT CAN BE DONE TO IMPROVE THE PROVISION OF DIGITAL SKILLS IN EDUCATION AND TRAINING?

DR. GEORGI DIMITROV, MBA

HEAD OF UNIT DIGITAL EDUCATION,
EUROPEAN COMMISSION,
DIRECTORATE GENERAL EDUCATION AND CULTURE

Technological progress has raised exponentially the need for digital skills and competences at all levels across the economy and society. Yet the level of digital skills of different segments of the population - be it professionals, adults or young people - remains unsatisfactory low. Georgi Dimitrov (European Commission, DG Education and Culture) will provide an overview of the priorities and objectives of the Commission's Digital Education Action Plan 2021-2027, with particular attention to the initiatives aiming at strengthening digital skills development. By looking at recent available data, he will focus on the advantages and the role that an effective provision of informatics in school education can play to promote active, responsible and safe use of technologies from a young age.

ABOUT DR. GEORGI DIMITROV, MBA

Georgi Dimitrov is responsible for the Digital Education unit in the European Commission, Directorate General for Education and Culture. He joined the European Commission in 2008 and was first involved in various roles in setting up the European Institute of Innovation and Technology (EIT). He then helped to develop and launch HEInnovate, an initiative by the European Commission and the OECD aimed at supporting universities to become more entrepreneurial. He led the development of the first Digital Education Action Plan adopted in January 2018 and also of the new Digital Education Action Plan 2021-2027 that was adopted in September 2020. Before joining the Commission, Georgi worked for a leading multinational telecommunication company and in a software start-up in Germany. Georgi studied at the University of Bonn (M.A.), the University of Erlangen-Nürnberg (PhD) and the Open University UK (MBA in Technology Management).

WHEN: 15 JUNE 2022
TIME: 14:00 - 14:45 CEST
LOCATION: TEACHING LAB & ONLINE

TITLE OF KEYNOTE:
PROGRAMMING AS A MEDIUM

JENS MÖNIG

RESEARCHER AT SAP

Computers, apps and programming languages are still commonly referred to as tools that help us accomplish tasks by amplifying particular skills such as calculating and remembering. Yet as computers and their apps have evolved into channels of communication among us and our appliances, programming languages are becoming a medium letting us interface with the world and express our ideas. I will present the Snap! visual programming language and discuss its design principles from the perspective of encouraging learners to approach programming not just as a tool for production but as a medium for exploration.

Snap! Is a Scratch-like programming language that treats code-blocks as first class citizens instead of confining them to an editing modality. Embracing nested data structures and higher order functions Snap! lets learners create arbitrary control structures and even custom programming languages with just blocks. Snap! has been developed for UC Berkeley's introductory computer science course named "The Beauty and Joy of Computing".

ABOUT JENS MÖNIG

Jens Mönig is a researcher at SAP and makes interactive programming environments. He is fanatical about visual coding blocks. Jens is the architect and lead programmer, together with Brian Harvey, of UC Berkeley's "Snap! Build Your Own Blocks" programming language, used in the introductory "Beauty and Joy of Computing" curriculum. Previously Jens has worked under Alan Kay on the GP programming language together with John Maloney and Yoshiki Ohshima, helped develop Scratch for the MIT Media Lab and written enterprise software at MioSoft. Jens is a fully qualified lawyer in Germany and has been an attorney, corporate counsel and lecturer for many years before rediscovering his love for programming through Scratch and Squeak. For leisure Jens likes guitar picking and strumming his mandolin.

WHEN: 16 JUNE 2022
TIME: 09:00 - 09:45 CEST
LOCATION: TEACHING LAB & ONLINE

TITLE OF KEYNOTE:
FROM RULE-DRIVEN TO DATA-DRIVEN COMPUTING EDUCATION IN K-12

PROF. MATTI TEDRE

SCHOOL OF COMPUTING, UNIVERSITY OF EASTERN FINLAND

The popular approaches to K-12 computing education today are based on analyzing and describing problems in a way that enables their solutions to be formulated as series of computational steps. Rule-based "classical" programming paradigms have come to dominate K-12 programming education, with some of their relevant key concepts and skills described under the title computational thinking (CT).

In the 2000s a number of data-driven technologies, most prominently machine learning (ML), have become commonplace in apps, tools, and services. Understanding some key ideas related to ML is becoming crucial for understanding how many key elements of our digital environment work. The power of traditional, rule-based computational thinking (CT1.0) to explain ML-driven systems is, however, limited, and new approaches to computing education are needed. A body of literature on how to teach some principles of ML and data-driven computing in K-12 education is emerging, but that body of literature relies on a set of concepts and skills very different from traditional CT1.0. This talk outlines the key changes in the conceptual landscape, educational practice, and technology for ML-enhanced CT (CT2.0) and compares it to the dominant computing education paradigm.

WHEN: 16 JUNE 2022
TIME: 14:00 - 14:45 CEST
LOCATION: TEACHING LAB & ONLINE

TITLE OF KEYNOTE:
AI IN THE CLASSROOM – STUDENTS COLLABORATING WITH AI TO SOLVE COMPLEX PROBLEMS

PROF. MAARTEN DE LAAT

CENTRE FOR CHANGE AND COMPLEXITY IN LEARNING, UNIVERSITY OF SOUTH AUSTRALIA

Applications of artificial intelligence (AI) are set to transform society, including how people work and learn. This growing ubiquity of AI in society poses significant challenges for educational systems: what will citizens in the 21 century need to know about, and do with AI? Currently there is very little research and experience on how schools and teachers adopt AI into the classroom and how our students work and learn together with AI.

In this keynote, I will present some current work at our Centre for Change and Complexity in Learning to help address this issue. I will showcase some initiatives where students will work together with AI to solve complex problems. Our mission is to offer an AI learning environment where students can take ownership over AI, experiment with it and develop AI to follow their imagination. The environment is a social space for exploration and critical evaluation, it is safe and inspiring. This is how we want students to treat AI. Rather than that AI is done to you, students should be able to play with AI, and through play, shape it so that AI starts to work for you and help you to go beyond your own capability.

WHEN: 17 JUNE 2022
TIME: 09:00 - 09:45 CEST
LOCATION: TEACHING LAB & ONLINE

PAPER PRESENTATIONS

15 JUNE 2022

SESSION 1: GAMES IN CT

LOCATION: TEACHING LAB, TU DELFT & ONLINE

10:00 - 10:20
HOW TO TEACH CODING THROUGH STORIES IN EARLY CHILDHOOD CLASSROOMS
BURCU CABUK, GÜLGÜN AFACAN ADANIR AND YASEMIN GÜLBAHAR

10:20 - 10:40
BEBRAS IN THE DIGITAL GAME < CAPTAIN BEBRAS > FOR STUDENTS' COMPUTATIONAL THINKING ABILITIES
YAN-MING CHEN AND JU-LING SHIH

10:40 - 11:00
A ROBOTIC-BASED APPROACH FOR CT DEVELOPMENT: CHALLENGES OF TEACHING PROGRAMMING CONCEPTS TO CHILDREN AND THE POTENTIAL OF INFORMAL LEARNING
RAFAEL ZEREGA, ALI HAMIDI, SEPIDEH TAVAJOH AND MARCELO MILRAD

11:00 - 11:15
MODELLING ZOMBIES AND OTHER DISEASES
STEWART POWELL, FARON MOLLER, DANIEL ARCHAMBAULT, PHOEBE ASPLIN, GRAHAM MCNEILL, MAX SONDAG AND CAGATAY TURKAY

11:15 - 11:30
INTEGRATING GAME-BASED LEARNING INTO COMPUTATIONAL THINKING CLASS FOR LOWER PRIMARY STUDENTS: LESSON DESIGN AND COURSE EFFECT
SHUHAN ZHANG, GARY K. W. WONG AND PETER C.F. CHAN

SESSION 2: STEM MEETS CT

LOCATION: TEACHING LAB, TU DELFT & ONLINE

12:00 - 12:20
INTEGRATING CT INTO BIOLOGY: USING DECISION TREE MODELS TO CLASSIFY CELL TYPES
JACQUELINE NIJENHUIS-VOOGT, SABIHA YENI AND ERIK BARENDSEN

12:20 - 12:40
A STEM-BASED LEARNING ACTIVITY INSTRUCTIONAL DESIGN OF QUADRUPED BIONIC ROBOTS
SHAUN-WEN CHEN AND JU-LING SHIH

12:40 - 13:00
COMPARISON OF STEM, NON-STEM, AND MIXED-DISCIPLINE PRE-SERVICE TEACHERS' EARLY CONCEPTIONS ABOUT COMPUTATIONAL THINKING
WENDY HUANG, CHEE-KIT LOOI AND IBRAHIM H. YETER

13:00 - 13:15
THE EFFECT OF UNPLUGGED PROGRAMMING AND VISUAL PROGRAMMING ON COMPUTATIONAL THINKING IN CHILDREN AGED 5 TO 7
LISA BOSGOED AND NARDIE FANCHAMPS

16 JUNE 2022

SESSION 3: TEACHERS AND CT

LOCATION: TEACHING LAB, TU DELFT & ONLINE

10:00 - 10:20
UNDERSTANDING TEACHERS' ATTITUDES AND SELF-ASSESSMENT TOWARDS COMPUTATIONAL THINKING
MARÍA ZAPATA-CÁCERES, NARDIE FANCHAMPS, ESTEFANÍA MARTÍN BARROSO AND PEDRO MARCELINO

10:20 - 10:40
DIGITAL COMPETENCE & COMPUTATIONAL THINKING FOR PRESCHOOL PRE-SERVICE TEACHERS: FROM LAB TO PRACTICE
ALI HAMIDI, RAFAEL ZEREGA, SEPIDEH TAVAJOH, MARCELO MILRAD AND ITALO MASIELLO

10:40 - 11:00
DISCUSSION | SMALL BREAK

11:00 - 11:15
THE TACTIDE EU PROJECT: TEACHING COMPUTATIONAL THINKING WITH DIGITAL DEVICES
MARC JANSEN, NARDIE FANCHAMPS, MARCELO MILRAD, MARCUS SPECHT AND ALI HAMIDI

11:15 - 11:30
HOW THE PRE-SERVICE TEACHERS ASSOCIATE COMPUTATIONAL THINKING WITH PRACTICES OF PROGRAMMING? A CASE STUDY OF AN INTRODUCTORY PROGRAMMING COURSE IN TEACHER EDUCATION
MEGUMI IWATA, JARI LARU AND KATI MÄKITALO

SESSION 4: LOCATION: TEACHING LAB, TU DELFT & ONLINE
CT AND PROGRAMMING IN SCHOOLS

12:00 - 12:20
PEDAGOGICAL USE OF SCRATCH CODING FOR CO-DEVELOPING ENGLISH LANGUAGE "LOCATIONS AND DIRECTIONS" BUILDING BLOCKS AND COMPUTATIONAL THINKING
SIU CHEUNG KONG AND WAI YING KWOK

12:20 - 12:40
LOG-BASED MULTIDIMENSIONAL MEASUREMENT OF CT ACQUISITION
ROTEM ISRAEL-FISHELSON AND ARNON HERSHKOVITZ

12:40 - 12:55
SOLVING DOMAIN-SPECIFIC PROBLEMS WITH COMPUTATIONAL THINKING
SHARON CALOR, IZAAK DEKKER, DORRITH PENNINK AND BERT BREDEWEG

12:55 - 13:05
PRECODING SKILLS - TEACHING COMPUTATIONAL THINKING TO PRESCHOOLERS IN SINGAPORE USING UNPLUGGED ACTIVITIES
VIDHI SINGHAL

13:05 - 13:15
COMPUTATIONAL THINKING IN LANGUAGE ARTS WHEN TEACHING CREATIVE AND EXPOSITORY WRITING
AYSEGUL BAYRAKTAR AND YASEMIN GULBAHAR

13:15 - 13:25
EXPLORING EMBEDDED COMPUTATIONAL THINKING IN STEM TEACHER EDUCATION
DORRITH PENNINK, IZAAK DEKKER, SHARON CALOR, BERT BREDEWEG AND MONIQUE PIJLS

17 JUNE 2022

SESSION 5: LOCATION: TEACHING LAB, TU DELFT & ONLINE
CONCEPTS AND REVIEWS

10:00 - 10:20
AN EXPLORATORY STUDY OF THE RELATIONSHIP BETWEEN COMPUTATIONAL THINKING AND CREATIVE ATTITUDES AMONG UNIVERSITY STUDENTS
MASANORI FUKUI, YUJI SASAKI AND TSUKASA HIRASHIMA

10:20 - 10:40
A REVIEW OF REVIEWS ON COMPUTATIONAL THINKING ASSESSMENT IN HIGHER EDUCATION
XIAOLING ZHANG AND MARCUS SPECHT

10:40 - 11:00
DEVELOPING A CONTINUOUS, RATHER THAN BINARY, CLASSIFICATION FOR MEASURING STEM JOBS
TED CARMICHAEL, JOHN STAMPER AND JOHN CARNEY

11:00 - 11:20
COMPUTATIONAL THINKING, HISTORY AND NON-FORMAL LEARNING- A WELL-CRAFTED BLEND!
IRENE SILVEIRA ALMEIDA AND AJITA DESHMUKH

SESSION 6: LOCATION: TEACHING LAB, TU DELFT & ONLINE
DESIGNING, ASSESSMENT, AND EVALUATION OF CT IN FORMAL AND NON-FORMAL SETTINGS

12:00 - 12:20
DESIGN OF AN EVALUATIVE RUBRIC FOR CT INTEGRATED CURRICULUM IN THE ELEMENTARY GRADES
FLORENCE SULLIVAN, LIAN DUAN AND EMRAH PEKTAS

12:20 - 12:40
SCAFFOLDED PROGRAMMING PROJECTS TO PROMOTE COMPUTATIONAL THINKING
VICTOR KOLESZAR, ALAR URRUTICOECHEA, ANDRÉS OLIVERI, MARÍA DEL ROSARIO SCHUNK AND GRACIELA OYHENARD

12:40 - 13:00
COMPUTATIONAL THINKING DASHBOARD: FOR LEARNERS IN JUPYTER NOTEBOOKS
BHOOMIKA AGARWAL

13:00 - 13:20
COMPUTATIONAL THINKING IN FLANDERS' COMPULSORY EDUCATION
NATACHA GESQUIÈRE AND FRANCIS WYFFELS

WORKSHOPS

WEDNESDAY 15 JUNE, 15:00 - 17:00 CET
LOCATION: TEACHING LAB, TU DELFT & ONLINE

IMTSECT - IMMERSIVE MULTIMODAL TECHNOLOGIES FOR STEAM EDUCATION AND COMPUTATIONAL THINKING

PROF. DR. ROLAND KLEMKE, KHALEELASYRAAF MAT SANUSI, DANIEL MAJONICA, MELINA ROSE OPEN UNIVERSITEIT AND COLOGNE GAME LAB, TH KÖLN

Immersive technologies, such as those used for virtual and augmented reality, allow to create virtual environments in which users are fully immersed into interactive spaces.

Combined with methods of multimodal interaction, these immersive environments allow for simulating natural ways of communication and interaction of human beings and software systems.

For education in STEAM (Science, Technology, Engineering, Arts, Mathematics) or Computational Thinking, such technologies enable learners to explore complex phenomena in safe environments with a maximum of interaction and intensity.

Especially in fields, where interaction with real environments would be too expensive (such as learning with industry scale robots), too dangerous (such as certain experiments in chemistry), or simply not possible (such as traveling through time or space), immersive technologies can enable learning and training that would otherwise simply not be possible.

This workshop generally introduces immersive technologies and the principles of multimodal interaction. Along several examples from past and ongoing research and development projects, participants get to know the possibilities and benefits of immersive multimodal technologies for education and beyond.

Participants will be enabled to
- **Explore immersive multimodal technologies**
- **Understand core elements of immersive learning solutions**
- **Design own educational ideas into immersive multimodal concepts**

WEDNESDAY 15 JUNE, 15:00 - 17:00 CET
LOCATION: TEACHING LAB, TU DELFT & ONLINE

FLUI.GO | LEARN THROUGH PLAY WITH THE FLUI.GO KIT

FLUI.GO

Flui.Go Kit is not just a toy; it is a open-ended play system that uses creativity to make playing and learning a holistic and evolving experience.

The Flui.Go Kit supports traditional STEM classes by helping to:

- **Teach scientific principles in a playful way.**
- **Develop critical thinking and problem-solving skills.**
- **Promote teamwork through collaboration when performing the experiments.**
- **Encourage imagination and curiosity.**
- **Capture the student's attention with a 'hands-on' approach.**

During this workshop you will have the chance to discover the Flui.Go Kit!

You will be guided through the learning material included in the kit and the various experiments that you can perform.

Experience first hand the innovative nature of the Flui.Go kit and the benefits that it can bring to your STEM classes.

More information: www.fluigoscience.com

WEDNESDAY 15 JUNE, 15:00 - 17:00 CET
LOCATION: TEACHING LAB, TU DELFT & ONLINE

COMPUTATIONAL THINKING WITH PYTHON IN THE MATH CLASSROOM

TEXAS INSTRUMENTS: BERT WIKKERINK (T3 NETHERLANDS) AND KOEN STULENS (T3 FLANDERS)

Challenge your students to solve problems in a creative way and stimulate them to create logical algorithms so a machine can support them in getting to the solution. Get them to learn their surrounding digital world by exploring and coding mathematical concepts in Python.

Concrete examples will show the connection between Mathematics and Computational Thinking and to Computational Thinking deserves it place in math education:

- **From Euclid algorithm to the Galton board**
- **Real word algorithms: K-means, Prim, ...**
- **Mathemagical Art, iterative procedures with graphical patterns**

BRING STEM & PHYSICAL COMPUTING INTO EDUCATION

TEXAM INSTRUMENTS: LUDOVIC WALLAART (T3 NETHERLANDS) AND KOEN STULENS (T3 FLANDERS)

How to bring physical computing easily into to the classroom to encourage your students to create systems to collect real data and to take (logical) decisions that lead into predicted actions.

MicroPython makes it easy to communicate with an MCU: e.g. the BBC micro:bit and the TI-Innovator Hub with a TI MSP432 LaunchPad Board.

Concrete examples will show how Physical Computing brings an extra dimension to Python programming and explorative learning:

- **What is sound and how does it create music?**
- **Data Analysis: Measuring > Analyzing > Action**
- **Pet Car Alarm – an interdisciplinary STEM project**

*This workshop contains two workshops that are related to each other

THURSDAY 16 JUNE, 15:00 - 17:00 CET
LOCATION: TEACHING LAB, TU DELFT & ONLINE

COMPUTATIONAL THINKING IN STEM EDUCATION

DR. HANNO VAN KEULEN, ASSOCIATE PROFESSOR AND DIRECTOR OF STUDIES OF THE MSC SCIENCE EDUCATION & COMMUNICATION AT DELFT UNIVERSITY OF TECHNOLOGY.

STEM is an acronym of Science, Technology, Engineering and Mathematics. It can pertain to any combination of the learning objectives and activities native to these disciplines. In a wider sense, STEM stresses the integral, holistic nature of many phenomena, objects and processes in the material world. Counting, computing, and programming, like observing, experimenting, hypothesizing, modelling, or causal reasoning is something that occurs naturally in many STEM activities in education. Computational thinking may be an objective in itself, or a means to achieve other attainment targets.

In this presentation, computational thinking in STEM will be addressed in three different situations. The first is the world of early childhood, where children learn predominantly through embodied perception and action. Notions like up and down, left and right, forward and backward are explored with the body and applied to manipulate artifacts, such as BeeBot, that can be programmed through pushing buttons.

The second example draws on an experiment in which children aged 9-14 with an Autism Spectrum Disorder (ASD) learned to build and program a robot (OzoBot, LegoMindstorms), to simulate shopping in a supermarket. They learned computational thinking, but more importantly, this task is a context to acquire social skills. Firstly, by collaborating in the technological and computational challenges, secondly, to solve challenges with a social character, like avoiding collisions with other customers-robots; asking for help to find out where empty bottles can be returned, et cetera. When possible, hands-on experiences with LegoMindstorms supermarket challenges will be provided.

The third example draws on design projects in upper secondary education in so-called Technasium schools. These schools provide students with real STEM projects, e.g., on the energy transition, water management, environmental hazards. Often, computational thinking and programming is part of the challenge.

We will end with reflections on the curriculum, on teacher training, and on cooperation of schools with IT-professionals to prepare children and students for our highly technological society.

THURSDAY 16 JUNE, 15:00 - 17:00 CET
LOCATION: TEACHING LAB, TU DELFT & ONLINE

COMPUTATIONAL THINKING WITH YOUR HANDS

DR. NARDIE FANCHAMPS, OPEN UNIVERSITY, THE NETHERLANDS AND DR. CHRISTIAN GLAHN, ZHAW, SWITZERLAND

The development of computational thinking can be stimulated by means of a variety of unplugged and plugged-in applications, programming environments and materials. Educational robots are equipped with sensors and motors that can be programmed to use the sense-reason-act (SRA) approach. However, in physical computing programming is not limited to writing computer code or software. Physical computing also allows programming with hardware and the environment. This generates opportunities for students who have not fully developed competences to abstract processes into steps and rules. Moreover, using the environment as a programming platform allows for new and natural approaches cooperation, collaboration, and competition in the computational thinking classroom.

In this hands-on, tangible physical computing workshop we will use the environment to program robots. It clarifies the impact of learning to program robots on cognitive development of computational thinking as a creative task. We present and apply learning activities for stimulating the students' creativity, collaboration, and exploration for demonstrating the SRA-approach in physical.

Physical computing refers to approaches of using computers to work in and interact with the environment. Often computers in physical computing lack a traditional display, mouse, and keyboard but are equipped with sensors, buttons, speakers, and motors. Today we find physical computing applications in smart speakers, smart lightbulbs, or even robots. Learning to control smart devices on different levels is key for responsible and democratic innovation.

The construct of SRA-programming is a supportive process that combines external, sensor-based measurements (sense), computing devices to process these measurements (reason), and executing desired actions as outcomes (act). The ability to anticipate changing conditions in the task design through sensor-based observations requires a different programming approach in comparison to linear, sequential solutions. While this approach is suitable for linking to the more traditional approaches of teaching programming in schools, it involves abstractions of using data and hardware at different levels. In this workshop we explore learning activities that help students to learn and develop these abstractions by using creativity, cooperation, and collaboration.

THURSDAY 16 JUNE, 15:00 - 17:00 CET
LOCATION: TEACHING LAB, TU DELFT & ONLINE

HEDY: A GRADUAL PROGRAMMING LANGUAGE

MARLEEN GILSING

A laptop is required for this workshop.

Many teachers want to teach programming to their pupils today, but how to approach it? Block-based languages like Scratch are great for the first steps, but at one point, you want to move on to textual languages such as Python. Python however is quite hard for kids to get started with since it is a language for professional programmers.

Hedy (www.hedycode.com) is the solution for this problem! The core idea of Hedy is that it uses different language levels. In level 1, there is hardly any syntax at all, for example, printing is done with:

'print hello teachers at CTE-STEM!'

In every level, new syntax and concepts are added, until kids are doing a subset of Python in level 20 with conditions, loops, variables and lists. The levelled approach means that learners do not have to learn all syntax rules at once. Hedy is aimed at children that want to get started with textual programming languages, but for whom starting with Python might still be too complex.

Hedy runs in the browser, is free to use and comes with built-in lesson plans, ready to use. It also has a special teacher's interface in which you can create classes and customise which assignments your students can work on.

Hedy was launched in early 2020 and since then almost 1.5 million Hedy programs have been created by children worldwide.

LOCATIONS

ONSITE

TEACHING LAB

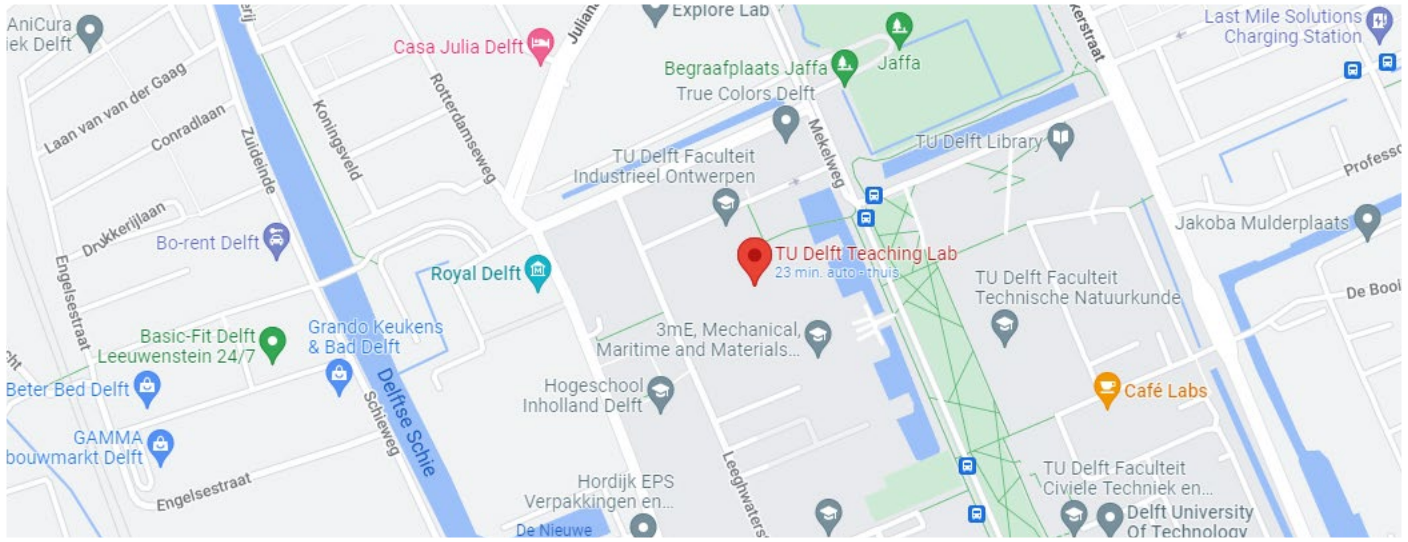
WHERE TO FIND THE TEACHING LAB?

Landbergstraat 15
2628CE Delft

WHERE TO ENTER (AND LEAVE) THE TEACHING LAB?

There are two entrances, the main entrance via Pulse and an entrance at the outdoor square (in front of IDE and the Teaching Lab).

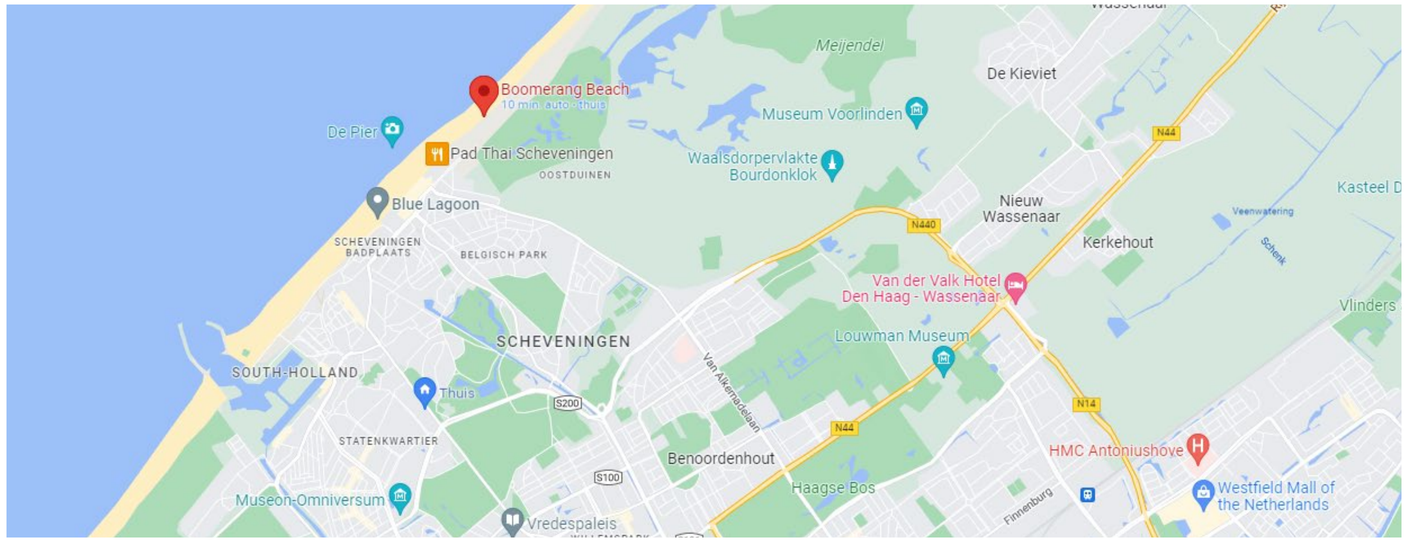
Whichever entrance you choose, always bear in mind that there may be sessions/ workshops taking place. The entrance via Pulse is the one that is least intrusive for sessions.



DINNER AT THE BEACH

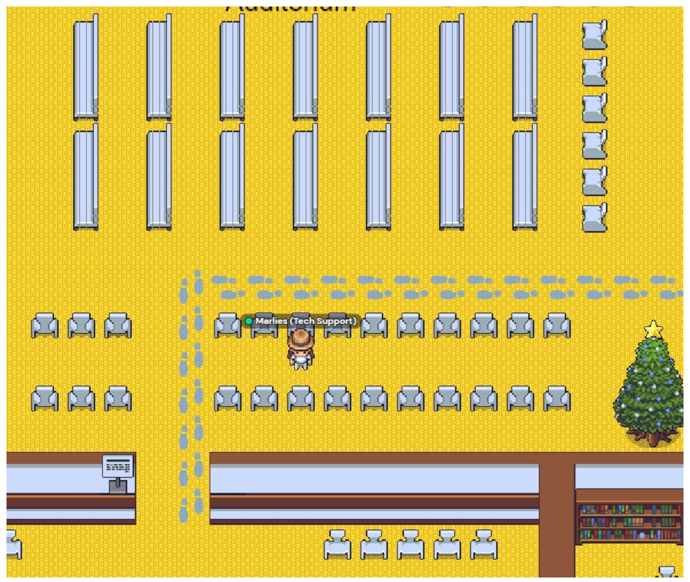
WHERE TO FIND BOOMERANG BEACH

Zwarte Pad 63
2586 JK Den Haag



ONLINE

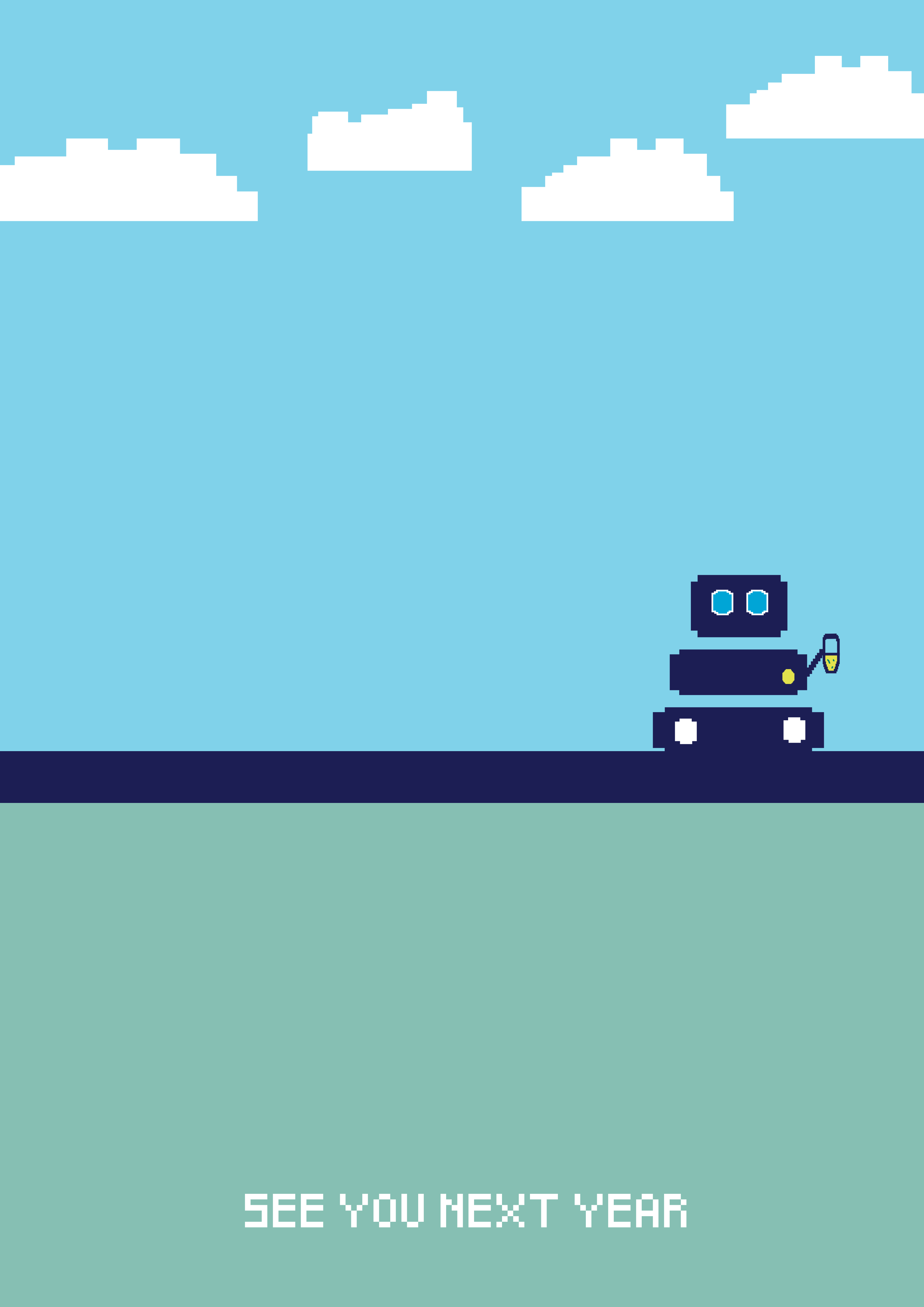
GATHERTOWN



WHERE TO FIND GATHERTOWN

GatherTown, can be found on the world wide web, we will provide a link to our space on our website.

It is only one click away.


SEE YOU NEXT YEAR