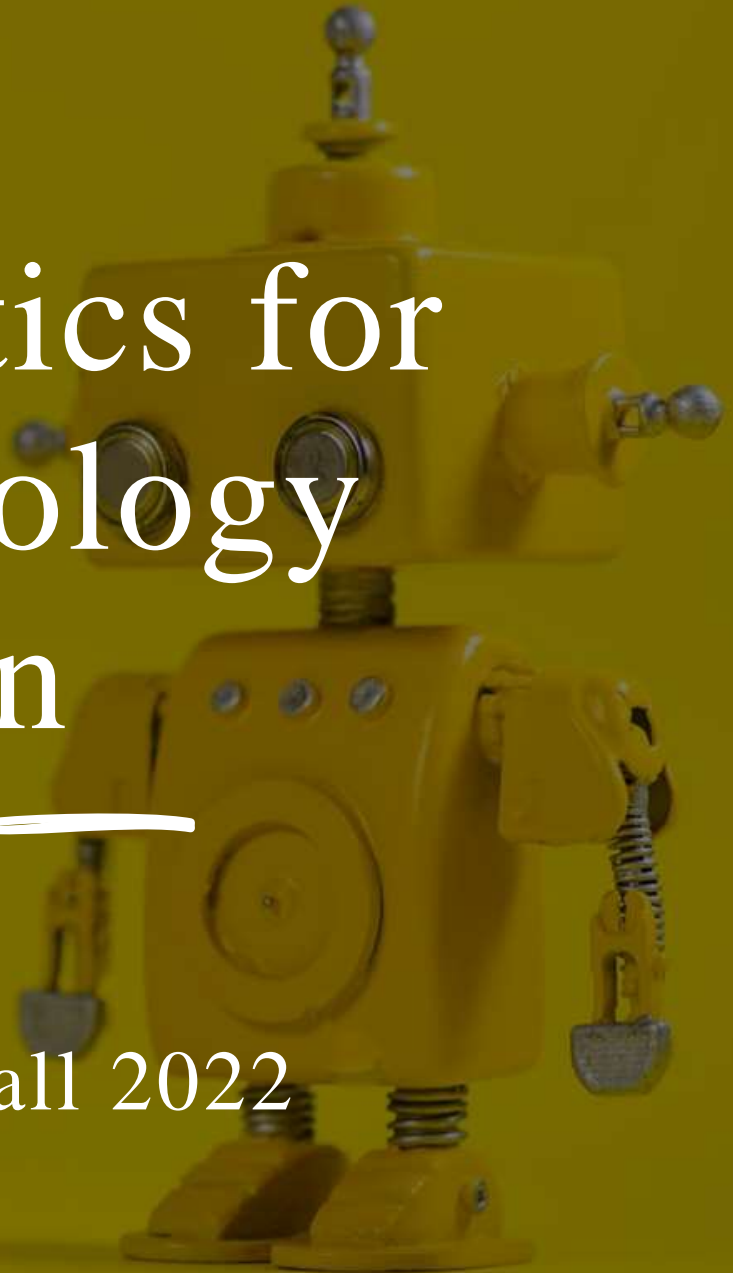


Theater Robotics for human technology education

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Catalog

- Brief summary of the article (with case discussion)
- Questions

Summary of the article

- Background*
 - An international emphasis on computing skills and efforts to renew curricula based it (Educational Robotics is among them)
 - The demand of bringing real-life context into teaching
 - Emphasis of interdisciplinary pedagogical approaches and projects (ex. combine art and robotics together)

Summary of the article

- Background
 - Robotics learning environment emphasizes solely the development of technical skills, and pay little attention to the skills learned in humanity
 - The integration between these two aspects is very rare
 - The complicated part comes when the abovementioned skills are needed to combine with humanity subjects
 - Digital tools can be applied effectively in diverse contexts to cross inter-disciplinary borders

Summary of the article

- Theater robotics framework
 - To complete a theater robotics project successfully, students are challenged to try and improve their skills in various school subjects within the same project (multidisciplinary nature)
 - Approach to culture*

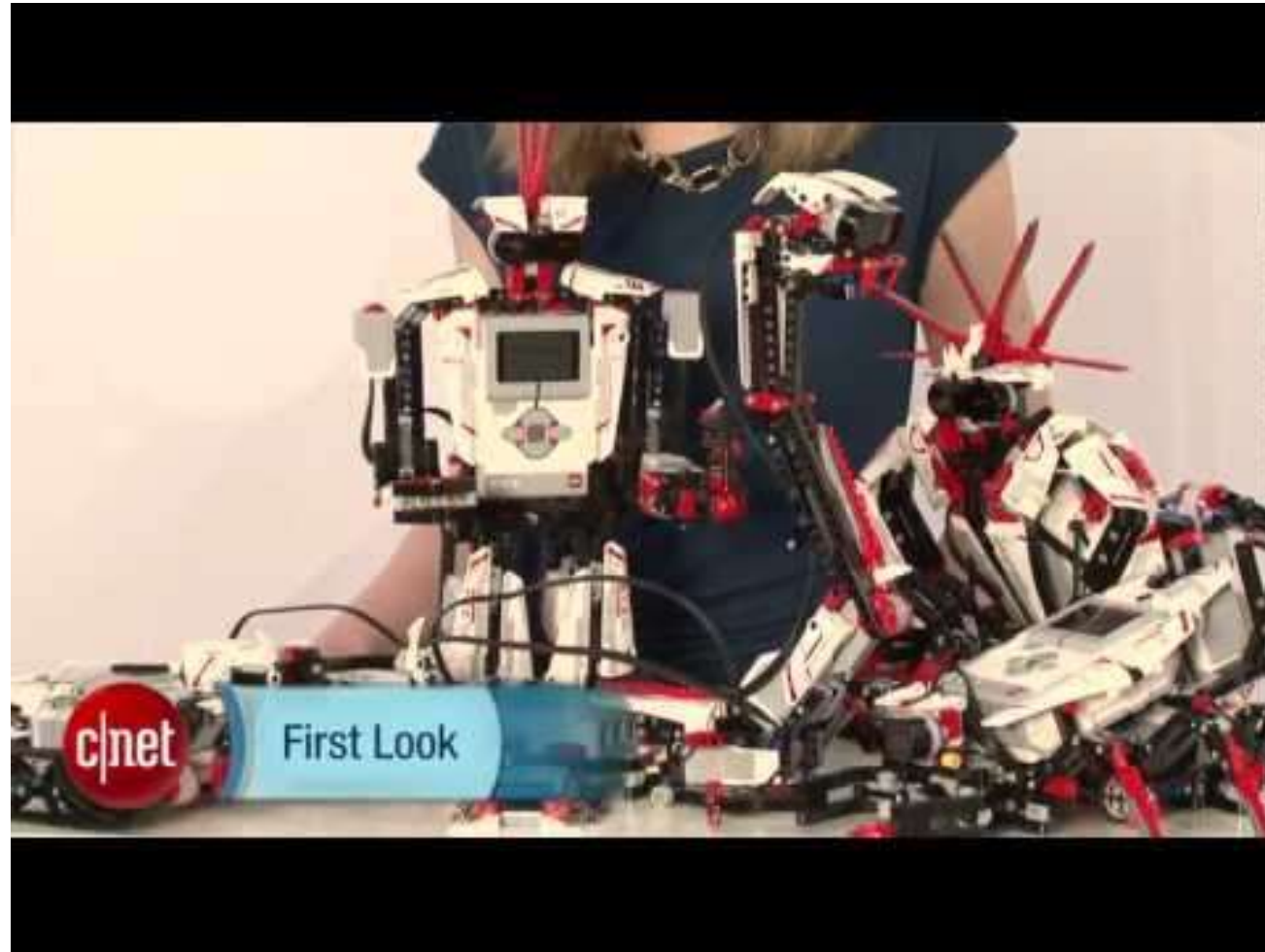
Table 1: A theater robotics process

Phase	Subjects	Remarks
1. Students choose a story or a theater play to implement	History, literature, religion	
2. Information collection and story scripting	Literature, articulacy, information retrieval and media literacy	IT skills include use of search engines and online resources
3. Robot design and building	Arts and design, IT, engineering, technology and handicraft, mathematic, physics	
4. Programming / defining scripts for the robot actors	Computer science, logic	IT skills focus to computer science core skills, such as programming fundamentals
5. Theater performance	Arts, sport, social skills, technology	

Summary of the article

- Theater robotics framework (Experiment)
 - Based on the theatre robotics concept in the SciKids' technology club of university of Eastern Finland. A group of 8-13 children present story of Red Riding Hood with Lego Mindstorms EV3 robotics sets
 - To analyze the feasibility of Lego Mindstorms robotics set for theater robotics
 - Flexibility, expandability, durability, and the total cost of the learning environment
 - The features of hardware and software that would be needed when implementing the theater robotics framework

Summary of the article



Summary of the article

- Theater robotics framework (Experiment)
 - RobotStory scripting
 - Robot actors
 - Stage
 - Central Director Unit

Summary of the article

- RobotStory scripting
 - Users are adopting a role of a playwright or a scriptwriter when they are using the environment, rather than a traditional role of a programmer
 - The play is divided to a set of pages each presenting small sketches which visualize events on a stage
 - Pages are created by defining actions for the actor robots with a graphical user interface
 - "Learn coding through playing"

Summary of the article



Cubetto: Coding for kiddos

Summary of the article



Summary of the article

- Robot actors (Arduino)
 - A Bluetooth module is needed for connecting the Central Director Unit with the robot
 - Special infrared LEDs are needed for positioning the robots with stage module's machine vision system
- Stage (Computer vision)
 - The stage is equipped with a robot positioning system implemented using a machine vision approach
 - To make the robot actors behave properly, there is an absolute need to detect their position on the stage
- Central Director Unit (Raspberry PI 2)
 - Using Raspberry Pi 2, a credit-sized low-cost computer to maintain communication between different parts of the system

Summary of the article

- Conclusion: Still not inclusive enough
 - Many robotics used for educational purposes including the Lego one is too expensive for deployment
 - existing programming solutions for educational robotics are geared towards traditional procedural or objectoriented programming approach and they do not support the inter-disciplinary motivation behind theater robotics: to combine storytelling with the learning of technology
 - Complexity is underestimated

Discussion questions

- How have your life and perception of things changed after learning computing?
- Do you think this kind of interdisciplinary and project-based computing learning can replace the current learning system, or it can just be a supplement, why?
- Putting yourself in the students' shoes, how do you view the effectiveness/shortcoming of this kind of interdisciplinary and project-based computing learning (consider IM as an example?)
- Do you think this way of learning can really spread in the global education framework?