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# Pomelo, a Collaborative Education Technology Interaction Robot

**Ece Tabag**, [ece.tabag@hisarschool.k12.tr](mailto:ece.tabag@hisarschool.k12.tr)  
C.S. IdeaLab, Hisar School, Istanbul, Turkey

**Yoel Nasi**, [yoel.nasi@hisarschool.k12.tr](mailto:yoel.nasi@hisarschool.k12.tr)  
C.S. IdeaLab, Hisar School, Istanbul, Turkey

**Can Aydın**, [can.aydin@hisarschool.k12.tr](mailto:can.aydin@hisarschool.k12.tr)  
C.S. IdeaLab, Hisar School, Istanbul, Turkey

**Andy Emre Kocak**, [emre.kocak@hisarschool.k12.tr](mailto:emre.kocak@hisarschool.k12.tr)  
C.S. IdeaLab, Hisar School, Istanbul, Turkey

**Rana Taki**, [rana.taki@hisarschool.k12.tr](mailto:rana.taki@hisarschool.k12.tr)  
C.S. IdeaLab, Hisar School, Istanbul, Turkey

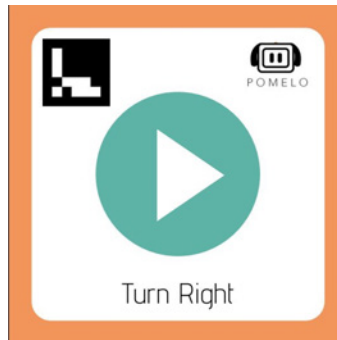
**Batuhan Bayraktar**, [batuhan.bayraktar@hisarschool.k12.tr](mailto:batuhan.bayraktar@hisarschool.k12.tr)  
C.S. IdeaLab, Hisar School, Istanbul, Turkey

**Sedat Yalcin**, [sedat.yalcin@hisarschool.k12.tr](mailto:sedat.yalcin@hisarschool.k12.tr)  
C.S. IdeaLab, Hisar School, Istanbul, Turkey

Pomelo is an educational robot that can be programmed through psychical code blocks and can move in desired patterns. Pomelo is suitable for elementary students between the ages of 4 to 7. Its aim is to teach coding and algorithmic thinking to younger kids in a simple and entertaining way.

There are many different coding platforms for kids to learn basic programming but most of them are in a computer environment that may create an isolated setting when they are getting started with programming which might discourage some students from learning. This approach is not suitable for younger ages since they are more interested in playing, rather than coding on a abstract platform. Pomelo, however, counteracts this as it is a physical robot that can be coded with simple blocks.

Pomelo consists of two main parts which are the code blocks and the robot. Our main goal when designing Pomelo was to create an environment for people to learn the basics of programming at a young age. To accomplish this, we implemented physical code blocks to program Pomelo so that even elementary school students can give instructions without difficulties. The icons on the code blocks make it easy to program Pomelo for even students that can't quite read. The code blocks are similar to the "ABC" blocks that children play within elementary schools. These blocks contain several commands such as move forward, turn left and turn right. When kids stack these code blocks, Pomelo reads the instructions from top to bottom and moves accordingly. This allows kids to learn how programming works with fun activities like games or puzzles. We imagined Pomelo being used in a classroom environment where the teacher creates puzzles for students to solve together using Pomelo. These kinds of assignments will encourage collaboration between students as well as teach them essential skills like problem-solving and critical thinking.



*Fig.1 - A sample side of a code block*

The shell of the prototype has a friendly dog shape. The natural and amiable appearance improves the interaction with Pomelo and the kids. Before designing and 3D printing the shell, we showed different designs to elementary school students and a majority of students said that they would prefer to play with the dog-like design. To make the interaction less mechanical and more organic, Pomelo has eyes on the screen at the front of it that changes emotions accordingly to the interaction. An LCD screen displays Pomelo's eyes that were drawn and rendered using the Maya 2018 software.



*Fig.2 - 1st Prototype of Pomelo*



*Fig.3 - The Most Recent Prototype of Pomelo*

By making a physical toy-robot to teach algorithmic thinking, collaborative thinking, and problem solving skills, we wanted to enable students to collaborate together to solve problems like mazes and puzzles rather than working on the problem on their own. The main goal for this project was to create a robot that elementary school students can play and learn to code in a way that would make them interested in the STEM fields. We believe that learning to think like a programmer is not only beneficial to the future programmer but it is beneficial for everyone since skills like problem-solving and analytical thinking are essential for everybody.

## References

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