Autonomous Foosball Opponent
(Technical Report)

Educational Technology in K-12 Classrooms: Who Decides?
(STS Research Paper)

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by

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Preface

How are automated systems augmenting classroom education? To capitalize on increased classroom access to technology, both the design of automated systems must be reviewed.

The robotic foosball table is an autonomous system that operates one side of a foosball table to play against a human opponent. The system consists of a mechanical interface to control the foosball players, a camera and Raspberry Pi to detect the ball and plan a response, and a microcontroller connected to custom-designed printed circuit boards to control motors and collect sensor data. Subsystems are physically interconnected such that information regarding the state of the foosball game can be collected, processed, and converted into a desirable response, such as blocking an opponent's shot or scoring a goal. The project team combined entertainment applications of computer vision and robotics, seeking efficient real-time applications.

Educational technology has valuable applications in K-12 classrooms, but given divergent educational values, the problem of its optimum use is necessarily controversial. Educators, parents, students, and vendors of educational technology work to align educational technology policies with their divergent interests, ideas, and values. The preferred applications of educational technology vary according to their proponents' divergent educational philosophies. Groups that perceive the good in education primarily as individual learning, skills training, or competitive career preparation tend to favor broad inclusion of educational technology; conversely, groups that hold various educational philosophies that value personal growth or a capacity for responsible autonomy, or that perceive education as a collaborative, communal, and inclusive enterprise, tend to welcome educational technology only conditionally, within strict limits that ensure that the technology does not preclude or impair children's and teachers' direct interpersonal educational relationships.