Architecture meets gaming and robotics
Creating interactive prototypes and digital simulations for architects

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Abstract. This paper presents an approach to producing an interactive physical kinetic prototype and its digital simulation for architects using a series of proposed methods. Conventional architectural CAD applications alone are not always sufficient for illustrating ideas for adaptable and responsive architecture that can conditionally change its states over time. The use of technologies from game design and robotics has a potential to extend the role of architects beyond merely providing static formal design solutions to various spatial problems. The paper introduces methods for rapid prototyping and real-time interaction between physical kinetic prototypes and a digital application environment for simulation using readily available commodity hardware, such as Arduino microcontrollers, 9g servo motors, Kinect sensors, and Unity 3D game engine software with its computational physics. The paper also presents case studies using the approach and discusses possible applications and assessment of this approach.

Keywords: Interactive prototypes, simulation, game engine, robotics.