

## The Quest for Real-Time Virtual Human Control

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### Abstract

For over 30 years my students and I have investigated methodologies to control and animate virtual humans in real-time. From our early work in inverse kinematics and locomotion, to finite-state-machines, to methods adapted from motion analysis and psychology, our quest has been to improve controllability, task animations, and behavioral realism. Our Parameterized Action Representation (PAR) links animation control to higher level requirements such as executing instructions and understanding Natural Language. Our EMOTE work sought to add motion qualities to vary a given animation. Recent work on eye movement and attention exposes some of the subtle details needed for human simulation. The next generation of problems in computer animation will require tools for animating large heterogeneous groups of individuals "living" their daily lives in a complex environment.