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Everysense everywhere human communication

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This talk outlines new facilities that are arising in the hyper connected internet era within human media spaces. This allows new embodied interaction between humans, species, and computation both socially and physically, with the aim of novel interactive communication and entertainment. Humans can develop new types of communication environments using all the senses, including touch, taste, and smell, which can increase support for multi-person multi-modal interaction and remote presence. In this talk, we present an alternative ubiquitous computing environment and space based on an integrated design of real and virtual worlds. We discuss some different research prototype systems for interactive communication, culture, and play.

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Creating adaptable character animations through evolution for interactive environments

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The emergence of evolving search techniques (e.g., genetic algorithms) has paved the way for innovative character animation solutions. For example, generating human movements `without' key-frame data. Instead character animations can be created using biologically inspired algorithms in conjunction with physics-based systems. While the development of highly parallel processors, such as the graphical processing unit (GPU), has opened the door to performance accelerated techniques allowing us to solve complex physical simulations in reasonable time frames. The combined acceleration techniques in conjunction with sophisticated planning and control methodologies enable us to synthesize ever more realistic characters that go beyond pre-recorded ragdolls towards more self-driven problem solving avatars. While traditional data-driven applications of physics within interactive environments have largely been confined to producing puppets and rocks, we explore a constrained autonomous procedural approach. The core difficulty is that simulating an animated character is easy, while controlling one is difficult. Since the control problem is not confined to human type models, e.g., creatures with multiple legs, such as dogs and spiders, ideally there would be a way of producing motions for arbitrary physically simulated agents. This presentation focuses on evolutionary algorithms (i.e., genetic algorithms), compared to the traditional data-driven approach. We explain how generic evolutionary techniques are able to emulate physically-plausible and life-like animations for a wide range of articulated creatures in dynamic environments. We help explain the computational bottlenecks of evolutionary algorithms and possible solutions, such as, exploiting massively parallel computational environments (i.e., graphical processing unit (GPU)).

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