서울대학교 대학원 협동과정 인공지능 전공 (AI 대학원)

인공지능 세미나

How to train your virtual dragon, human, and octopus via deep learning

연사

이제희, CRO 부사장

NC SOFT

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장소 | 302동 105호

Abstract

The human musculoskeletal system is made up of 206 bones and over 600 muscles. Even simple movements such as walking and jumping require careful coordination between hundreds of muscles, which includes sending the right amount of excitation signal to individual muscles to move the body forward while maintaining its balance. This poses the notoriously challenging problem of finding control policies for high-order, high-dimensional dynamical systems. The first half of the talk will discuss how to create a computer model of the human musculoskeletal system and control the simulation model to perform various movements leveraging deep reinforcement learning. Specifically, three technical components, predictive gait analysis, intelligent gait analysis, and patient-specific musculoskeletal modeling, will be discussed to deal with common problems encountered in computer graphics and computational biomechanics. The second half of the talk will be devoted to creating virtual humans and virtual animals via data-driven and physics-based learning frameworks. The topics include creating agile and time-critically responsive characters from a collection of unorganized human motion data (SIGGRAPH 2021), learning a family of motor skills from a single motion clip (SIGGRAPH 2021), and reconstructing 3D human motion from dynamic view video (SIGGRAPH Asia 2021). All the ideas and algorithms to animate virtual humans can also be used to create virtual creatures that fly in the air with flapping wings or swim underwater. I will briefly present the research results on virtual creatures that have been conducted in the SNU movement research lab over the past few years.

Biography

Jehee Lee is CRO (Chief Research Officer) of NCsoft leading AI/NLP research. Before joining NCsoft, he was a professor of Computer Science and Engineering at Seoul National University. His research interests span computer graphics, animation, computational biomechanics, machine learning, and robotics. He is interested in developing new ways of understanding, representing, planning, and simulating human and animal movements. He co-chaired Pacific Graphics 2019, MIG 2018, and ACM/EG Symposium on Computer Animation in 2012. He has served as an associate editor of IEEE Transactions on Visualization and Computer Graphics and he is the technical papers chair of SIGGRAPH Asia 2022.

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