Data-driven Locomotion Controllers for Real-time Character Animation

Dr Taku Komura
Associate Professor
Institute of Perception, Action and Behavior
School of Informatics
University of Edinburgh
UK

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The Hong Kong Polytechnic University

► Abstract
I will present about two data-driven frameworks based on neural networks for interactive character control. The first approach is called a Phase-Functioned Neural Network (PFNN). The weights of network are computed via a cyclic function which uses the phase, user control, the previous state and the geometry of the scene as input, so network can automatically produce high quality motions that achieve the desired user control. System can also produce motions where the character adapts to different geometric environments. This work is most appropriate for controlling characters in interactive scenes such as computer games and virtual reality systems. The second approach is called Mode-Adaptive Neural Networks. This is an extension of the PFNN and has the capability to control quadruped characters, where the locomotion is multimodal. The system is composed of the motion prediction network and the gating network. The motion prediction network computes the character state in the current frame. The gating network dynamically updates the weights of the motion prediction network with expert weights. We show that this architecture is suitable for encoding the multi-modality of quadruped locomotion and synthesizing responsive motion in real-time.

► About the Speaker
Taku Komura is a Reader (Associate Professor) at the Institute of Perception, Action and Behavior, School of Informatics, University of Edinburgh. As the leader of the Computer Graphics and Visualization Unit his research has focused on data-driven character animation, physically-based character animation, crowd simulation, cloth animation, anatomy-based modelling, and robotics. Recently, his main research interests have been the application of machine learning techniques for animation synthesis. He received the Royal Society Industry Fellowship (2014) and the Google AR/VR Research Award (2017).

ALL are welcome!
Enquiries : Professor George Baciu
Email : csgeorge@comp.polyu.edu.hk
Tel : 2766 7272