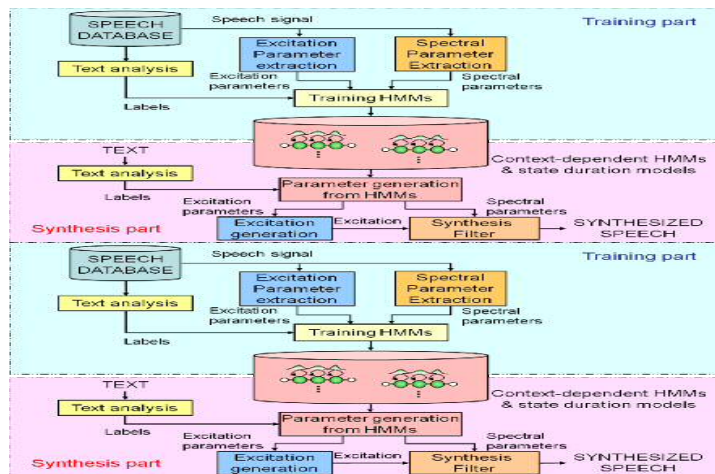

IT, Robotics

HMM-based speech synthesis --toward human-like talking machines

Prof. Keiichi TOKUDA

For constructing spoken dialog systems which can realize natural human-computer interaction, speech synthesis systems are required to have an ability to generate speech with arbitrary speaker's voice, various speaking styles, emphasis, emotional expressions, and so on. "HMM-based speech synthesis" is a new approach to provide such flexibility in speech.



A novel speech synthesis approach



Practical applications: cellphones, car navigation, etc.



The digital signage system "Mei-chan" can speak with emotional expression

References :

- [1] K. Tokuda, Y. Nankaku, T. Toda, H. Zen, J. Yamagishi, K. Oura, "Speech Synthesis Based on Hidden Markov Models," Proceedings of the IEEE, vol.101, no.5, pp.1234-1252, May 2013.

Passive walking robots heading for positive walking

Prof. Akihito SANO

Passive walker with knees can walk down shallow slope WITHOUT motor, sensor and computer. Sano's laboratory has been conducting constant study of passive walking since nearly 10 years. On 29 May 2009, passive walking robot achieved a non-stop walk for 13 hours and 45 minutes on a treadmill. Biped anthropomorphic passive walker is a close resemblance between the gait of walker and that of human race. Sano apply this passive walking technology to the support and the rehabilitation of walking to improve QOL. Carrying robot works much like a hand cart. This offers 10-20 kg on-body payload capacity.



Guinness



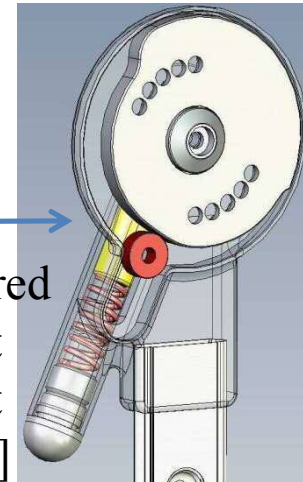
Walking Android

Redistribution of Energy

ACTIVE



- Non-powered
- Ultra Light weight [540g]



Hip cam-spring mechanism

References :

- [1] Y. IKEMATA, A. SANO, H. FUJIMOTO: "A Physical Principle of Gait Generation and its Stabilization from Mechanism of Fixed Point," Proc. of the IEEE Int. Conf. on Robotics and Automation, pp. 836-841 (2006).
- [2] Y. IKEMATA, K. YASUHARA, A. SANO, H. FUJIMOTO: "Dynamic Effects of Arc Feet for Leg Motion of Passive Walker," Proc. of the IEEE Int. Conf. on Robotics and Automation, pp. 2755-2760 (2009).