

Tuesday August 8, 2000

8:10 – 8:30 Briefing of AMAM
H. Kimura
University of Electro-Communications

Keynote Speech I

8:30 - 9:10 Neuronal Mechanisms for the Adaptive Control of Locomotion in the Cat
T. Drew
University of Montreal

Keynote Speech II

9:10 - 9:50 Nonlinear Dynamics of the Human Motor Control - Real-Time and Anticipatory Adaptation of Locomotion and Development of Movements
G. Taga
University of Tokyo

Session TuA-I: Visual Adaptation Mechanisms of Systems in Locomotion

Chairs: *T. Drew*¹ and *A.E. Patla*²
¹University of Montreal, ²University of Waterloo

9:50 - 10:20 Local Path Planning during Human Locomotion over Irregular Terrain
A.E. Patla, E. Niechwiej and L. Santos
University of Waterloo

10:20 - 10:30 BREAK

10:30-10:50 Emergence of Quadruped Walk by a Combination of Reflexes
K. Hosoda, T. Miyashita and M. Asada
Osaka University

10:50 – 11:10 A Model of Visually Triggered Gait Adaptation
M.A. Lewis and L.S. Simo
Iguana Robotics

Session TuA-II: Neuro-Mechanics

Chairs: *G. Taga¹ and H. Witte²*

¹University of Tokyo, ²Friedrich-Schiller-Universität Jena

11:10 - 11:40 Biologically Inspired Dynamic Walking of a Quadruped on Irregular Terrain - Adaptation at Spinal Cord and Brain Stem

H. Kimura and Y. Fukuoka

University of Electro-Communications

11:40 - 12:00 Adaptive Posture Control of a Four-Legged Walking Machine Using Some Principles of Mammalian Locomotion

W. Ilg¹, J. Albiez¹, H. Witte² and R. Dillmann¹

¹Forschungszentrum Informatik Karlsruhe

²Friedrich-Schiller-Universität Jena

12:00 - 12:20 Stabilization of Periodic Motions - from Juggling to Bipedal Walking -

S. Miyakoshi¹, G. Taga² and Y. Kuniyoshi¹

¹Electrotechnical Laboratory, ²University of Tokyo

12:20 - 12:40 Synchronized Robot Drumming by Neural Oscillators

S. Kotosaka¹ and S. Schaal²

¹Kawato Dynamic Brain Project(ERATO/JST)

²University of Southern California

12:40 - 13:40 LUNCH

Session: TuP-II: Design of Neural Controller

Chairs: *A.J. Ijspeert¹ and A. Ishiguro²*

¹University of Southern California, ²Nagoya University

15:30 - 16:00 A Neuromechanical Investigation of Salamander Locomotion

A.J. Ijspeert

University of Southern California

16:00 - 16:20 Evolutionary Creation of an Adaptive Controller for a Legged-Robot:

A Dynamically-Rearranging Neural Network Approach

A. Fujii¹, A. Ishiguro¹, K. Otsu¹, Y. Uchikawa¹, T. Aoki² and

P.Eggenberger³

¹Nagoya University, ²Nagoya Municipal Industrial Research Institute

³ATR

16:20 - 16:40 On Nonlinear Dynamics that Generates Rhythmic Motion with Specific Accuracy

K. Senda and T. Tanaka

Osaka Prefecture University

Wednesday August 9, 2000

Keynote Speech IV

8:30 - 9:10 Sensorimotor Integration in Lampreys and Robot I: CPG Principles
A.H. Cohen¹ and M.A. Lewis²
¹University of Maryland, ²Iguana Robotics

Session WeA-I: Adaptive Locomotion

Chairs: *A.H. Cohen¹ and M.A. Lewis²*
¹University of Maryland, ²Iguana Robotics

9:10 - 9:40 Sensorimotor Integration in Lampreys and Robots II: CPG Hardware
Circuit for Controlling a Running Robotic Leg
M.A. Lewis¹, R.E. Cummings², M. Hartmann³ and A.H. Cohen⁴
¹Iguana Robotics, ²Johns Hopkins University
³California Institute of Technology, ⁴University of Maryland

9:40 - 10:00 Decentralized Autonomous Control of a Quadruped Locomotion Robot
K. Tsujita, K. Tsuchiya and A. Onat
Kyoto University

10:00 - 10:20 Control of Walking Machines With Artificial Reflexes
M. Guddat and M. Frik
Gerhard-Mercator University

10:20 - 10:40 Novel Gaits for a Novel Crawling/Grasping Mechanism
R. M. Voyles
University of Minnesota

10:40 - 10:50 BREAK

Session WeA-II: Modeling and Analysis of Motion

Chairs: *M. Garcia¹ and H. Kimura²*
¹University of California, ²University of Electro-Communications

10:50 - 11:20 Damping And Size: Insights And Biological Inspiration
M. Garcia¹, A. Kuo², A. Peattie³, P. Wang¹ and R. Full¹
¹University of California, ²University of Michigan
³Lewis and Clark College

11:20 - 11:40 Approximate Solutions for Gait Simulation and Control
P. Bourassa, M-R. Meier, P. Micheau and P. Buaka
University of Sherbrooke

11:40 - 12:00 Energy Optimal Trajectory Planning of Biped Walking Motion
R. Liu and K. Ono
Tokyo institute of Technology

12:00 - 12:20 Biped Humanoid Robots in Human Environments:
Adaptability and Emotion
H. Lim¹ and A. Takanishi²
¹Kanagawa Institute of Technology, ²Waseda University

12:20 - 13:40 LUNCH

Thursday August 10, 2000

Keynote Speech VI

8:30 - 9:10 Robust Behavior of the Human Leg
R. Blickhan, A. Seyfarth, H. Wagner, A. Friedrichs and M. Gunther
Friedrich-Schiller-Universität Jena

Session ThA-I: Adaptive Mechanics

Chairs: *R. Blickhan¹ and K. Ono²*
¹Friedrich-Schiller-Universität Jena, ²Tokyo Institute of Technology

9:10 - 9:40 Quadrupedal Mammals as Paragons for Walking Machines
*H. Witte¹, R. Hackert¹, W. Ilg², J. Biltzinger¹, N. Schilling¹,
F. Biedermann¹, M. Jergas³, H. Preuschoft³ and M.S. Fischer¹*
¹Friedrich-Schiller-Universität Jena, ²Forschungszentrum Informatik
³Ruhr-Universität Bochum

9:40-10:10 Some Issues in Creating 'Invertebrate' Robots
I.D. Walker
Clemson University

10:10-10:30 BREAK

10:30-10:50 An Adaptive Controller for Two Cooperating Flexible Manipulators
C.J. Damaren
University of Toronto

10:50 - 11:10 Spontaneous Generation of Anti-Gravitational Arm Motion Based on Anatomical Constraints of the Human Body
N. Ogihara and N. Yamazaki
Keio University

11:10 - 11:30 Interaction Between Motions of the Trunk and the Limbs and the Angle of Attack During Synchronous Gaits of the Pika (*Ochotona Rufescens*)
R. Hackert, H. Witte and M.S. Fischer
Friedrich-Schiller-Universität Jena

11:30 - 11:50 Optimal Attitude Control for Articulated Body Mobile Robots
E.F. Fukushima and Shigeo Hirose
Tokyo Institute of Technology

11:50 - 13:10 LUNCH

Session ThP-I: Behavior and Motion of Humans & Humanoids

Chairs: *Ch. Lutzenberger¹ and T. Ogata²*
¹Technische Universitat Munchen
²Waseda University

13:10 - 13:40 Analysis of Hemiparetic Gait by Using Mechanical Models
Ch. Lutzenberger and F. Pfeiffer
Technische Universitat Munchen

13:40 - 14:00 Real-Time Interactive Motion Generator of Human Figures
Y. Nakamura^{1,2} and K. Yamane¹
¹University of Tokyo
²CREST(Japan Science and Technology Corporation)

14:00 - 14:20 Adaptive Motions by the Endocrine System Model in An Autonomous Robot
T. Ogata and S. Sugano
Waseda University

14:20 - 14:40 Self-Excited Walking of a Biped Mechanism
K. Ono, R. Takahashi, T. Shimada and A. Imadu
Tokyo Institute of Technology

14:40 - 15:00 Dynamics and Control of a Simulated 3-D Humanoid Biped
K. Sari, G.M. Nelson and R.D. Quinn
Case Western Reserve University

Friday August 11, 2000

Keynote Speech VIII

9:00 - 9:40 Dynamic Locomotion with Four and Six-Legged Robots
M. Buehler¹, U. Saranli², D.Papadopoulos¹ and D.Koditschek²
¹McGill University, ²University of Michigan

Session FrA-I: Technical Development of Mechanism and Control

Chairs: *M. Buehler¹ and K. Yoneda²*
¹McGill University, ²Tokyo Institute of Technology

9:40 - 10:00 Partial Leg Exchange and Active CG Control of Twin-Frame Walking Machine
K. Yoneda, Y. Ota, F. Ito and S. Hirose
Tokyo Institute of Technology

10:00 - 10:20 3D Posture Control by Using the Cat-Turn Motion
A. Miyajima, K. Yamafuji and T. Tanaka
University of Electro-Communications

10:20 - 10:40 Development of MEL HORSE
H. Takeuchi
Mechanical Engineering Laboratory

10:40 - 11:00 BREAK

Session FrP-II: Super-Mechano Systems

Chairs: *F. Matsuno*¹ and *R.M. Voyles*²
¹Tokyo Institute of Technology, ²University of Minnesota

11:00 - 11:20 Unit Design of Hyper-Redundant Snake Robots Based on a Kinematic Model

F. Matsuno and K. Mogi
Tokyo Institute of Technology

11:20 - 11:40 Dynamic Manipulability of a Snake-Like Robot with Consideration of Side Force and its Application to Locomotion Control

H. Date, Y. Hoshi and M. Sampei
Tokyo Institute of Technology

11:40 - 12:00 Development and Running Control of a 3D Leg Robot

T. Ikeda, T. Tamura and T. Mita
Tokyo Institute of Technology

12:00 - 12:20 Jumping Cat Robot with Kicking a Wall

M. Yamakita, Y. Omagari and Y. Taniguchi
Tokyo Institute of Technology

12:20 - 12:50 Closing Remarks

H. Witte
Friedrich-Schiller-Universität Jena

12:40 - 13:00 Discussion