

# Biped robot "MIKE"

M. Wisse and J. van Frankenhuyzen

Delft University of Technology, The Netherlands

<http://mms.tudelft.nl/dbl>



- 2D, fully self-contained
- Based on 'Passive Dynamic Walking'
- Powered with pneumatic McKibben muscles
- Walks on level floor
- Extremely simple controller: only foot-switch reflex

---

## Biped Locomotion Robot

K.Tsuchiya, S.Aoi, K.Tsujita

Graduate School of Engineering, Kyoto University

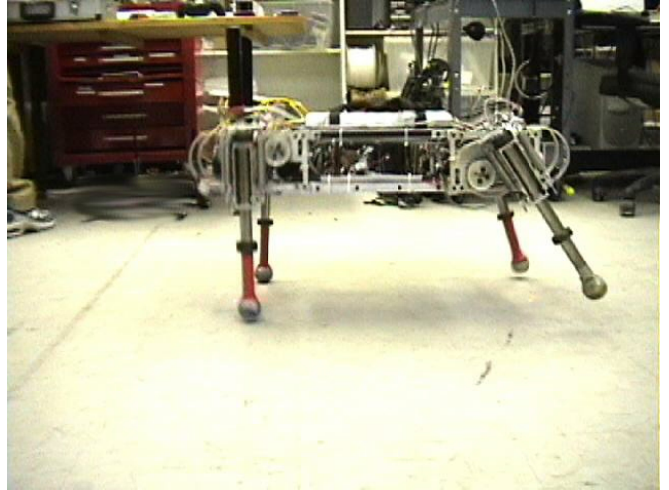


- Gait pattern control by nonlinear oscillators
- Phase of oscillator tuned by touch sensor signal of the tip of the leg
- Capable of adaptation to changing environments, locomotion speed, slope of the floor etc

# The "Scout II" Quadruped Robot

James Andrew Smith, Ioannis Poulakakis and Martin Buehler  
Ambulatory Robotics Laboratory  
Centre for Intelligent Machines, McGill University

- Excitation of passive dynamics to produce stable dynamic locomotion
- One active degree of freedom per leg (rotary motor)
- One passive degree of freedom per leg (prismatic spring)
- Capable of the Bound symmetric gait
- Capable of the Half-Bound asymmetric gait



---

# The Quadruped Robot "Tekken-I"

Y. Fukuoka and H. Kimura  
University of Electro-Communications

- Autonomous adaptation to irregular terrain
- Motion generation and adaptation based on biological concepts
- CPG (Central Pattern Generator) and reflexes
- Rolling motion feedback to CPG
- All parameters are fixed for kinds of irregular terrain



# Humanoid Robot "HOAP-1"

## (Humanoid for Open Architecture Platform #1)

FUJITSU

- Open Architecture for research
- Biologically inspired approach
- CPG/NP(Central Pattern Generator / Numerical Perturbation) based motion generation
- Parameters can be changed dynamically for adaptive motion



---

## Quasi Passive Dynamic

A.Orita and K.Osuka  
Kyoto University

- Quasi Passive dynamic walker
- The robot has two legs
- All joints are driven by DD motors
- Propose a new walking control method using ankle joint control



# Mobile Inspection Robot for Rescue Activities MOIRA

H.Kitajima and K.Osuka  
Kyoto University

- Mobile robot for searching a debris
- The robot has four links and three joints
- Each link has four caterpillars (up side, down side, left side and right side)
- This robot can be controlled by manual

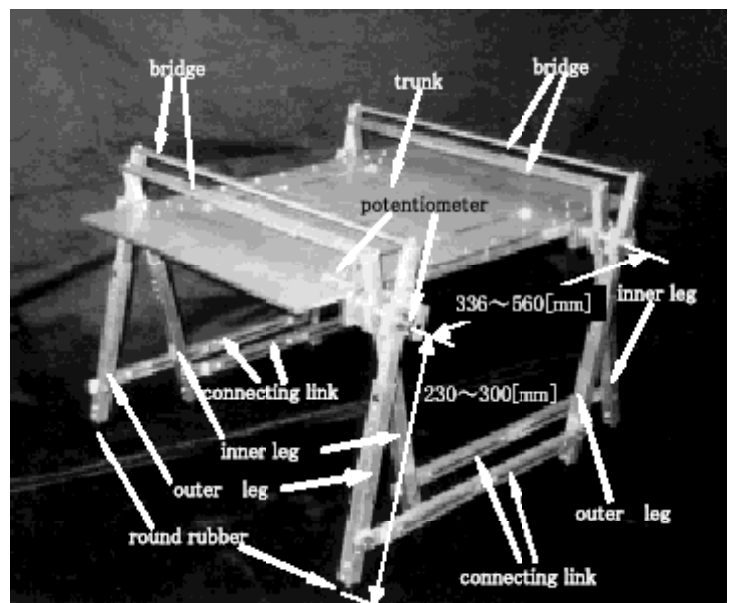


---

## Passive Dynamic Walker "Quartet I"

\*K.Osuka and \*\*T.Fujitani  
\*Kyoto University, \*\*Osaka Prefecture University

- Passive dynamic walker
- The robot has eight legs and each four legs are connected by linkages
- Show a stability of passive dynamic walk through simulations and experiments
- Show a bifurcation phenomenon in passive dynamic walk through simulations





# Passive Dynamic Walker "Quartet II"

K.Osuka and K.Kirihara

Kyoto University

- Passive dynamic walker
- The robot has eight legs and each four legs are connected by linkages
- Show a stability of passive dynamic walk through simulations and experiments
- Show a bifurcation phenomenon in passive dynamic walk through simulations and experiments



1998

---

## Quasi-Passive Dynamic Walker "Quartet III"

Y.Sugimoto, K.Osuka and Y.Saruta

Kyoto University

- Quasi Passive dynamic walker
- The robot has eight legs and each four legs are connected by linkages
- DD Motors are mounted as actuators
- Proposed some new walking controller for quasi passive dynamic walking



1999-2001

# A Salamander Robot

A. Hiraoka, Z.G. Zhang and H.Kimura  
University of Electro-Communications

- Potential model for the salamander locomotion with limb CPGs and body CPGs proposed by A.Ijspeert[1998].
  - Sensory reflex based on stretch-receptor neurons proposed by S.Grillner[1995]
  - Self-contained control system based on FPGA(Field Programmable Gate Array)
  - Trot walking on flat terrains of various frictions
  - Swimming motion in future
- 

