Biped Robots
Chairs: Bernard Espiau, Friedrich Pfeiffer

A Biped Robot that Jogs
M. Gienger, K. Loffler and F. Pfeiffer
Technische Universitat Munchen

- Design and Control of a Biped Walking Robot

- Dynamically Stable Walking and Jogging

- Realization of an Autonomous Robot

- Hardware in Progress, Results End of 2000

On the Stability of Biped With Point Foot-Ground Contact
R. Stojic and C. Chevallereau
Institut de Recherche en Cybernetique de Nantes

- Control of simple biped in under-actuated phase

- Rewritten of system equation with new variables

- Definition of a control law for stabilization and tracking

- Case of 2 links and 3 links system
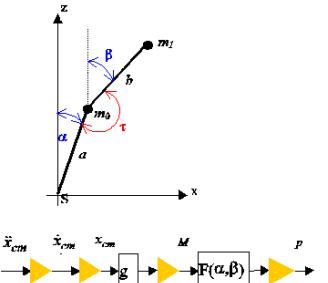
Balance Control of a Biped Robot Combining Off-line Pattern with Real-time Modification
Q. Huang[1], K. Kaneko[1], K. Yokoi[1], S. Kajita[1], T. Kotoku[1], N. Koyachi[1], H. Arai[1], N. Imamura[2], K. Komoriya[1] and K. Tanie[1]
[1]Mechanical Engineering Laboratory (MEL) and [2]Kobe City College of Technology

- Balance control of a biped robot

- Off-line walking pattern with real-time modification

- Walking on rough terrain and in environments with disturbances

- Confirmation by a biped dynamic simulator
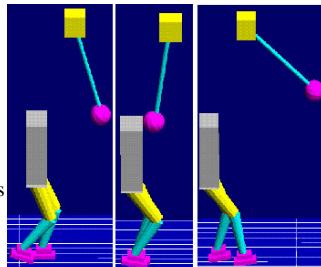
An Online Trajectory Modifier for The Base Link of Biped Robots To Enhance Locomotion Stability
J. Park and H. Cho
Hanyang University

- For sable locomotion, biped robots should have robust properties against various disturbances.

- The base trajectory

- in the vertical direction is modified depending on the magnitude of ZMP deviation form its safety boundary.

- A series of simulations show that the robot can walk with the proposed algorithms even when there is a certain amount of disturbance force.
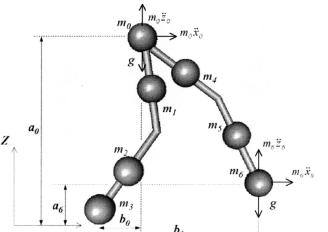
Design of Small Power Biped Robot by Load Sharing of Walking Gait
D. J. Kim[1], K. I. Kim[1], Yuan Fan Zheng[2], Zengqi Sun[3] and Fuchun Sun[3]
[1]Myong Ji University and [2]Ohio State University and [3]Tsinghua University

- Walking can be divided into one-foot and two-foot standing during the common speed smooth walking. In two-foot standing, the weight of the robot can be distributed to all joints. However, in one-foot standing, it is burdened to one foot, especially to the ankle joint.

- This problem is solved by a load sharing method, which distributes the load of the ankle to other joints.

- The current of ankle is significantly reduced to become less than the critical value.

- Load concentration problem has been solved by the load sharing method, which calculates the current to be consumed at each joint, and reprograms the motions of all the joints accordingly.
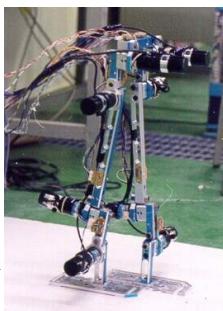
Design and Actuation Optimization of a 4 axes Biped Robot for Walking and Running
C. Chevallereau and P. Sardain
Universite de Poitiers

- Under-Actuated Robot

- Walking AND Running

- Optimal Reference Trajectories

- Adequation Technology-Dynamics