**Ron Jacobs, Intelligent Inference Systems Corporation**
"A Biologically Inspired Robot for Space Operations"

There is a strong need for legged systems that can travel and operate in difficult terrain, where existing wheeled vehicles cannot go. This is especially true for future missions to MARS (for example), where the planet surface is rugged and uneven. In the near future, we foresee that revolutionary legged robots will be used as part of a community of multi-intelligent agents on MARS.

Each individual legged robot will be able to execute tasks that are requested by lower and higher levels in the community. In designing such a revolutionary MARS Walker, we have used our extensive experience in a variety of different disciplines, such as computational intelligence, soft computing, robotics, biomechanics and neural control of human movements. Our experience is integrated towards a unique and new biologically-inspired approach in developing these legged robots. Smart artificial muscle-like actuators (currently under development at IIS Corp.) will drive the movements. We anticipate outfitting the MARS Walker with the abilities that are necessary for its role as a future intelligent agent in space. The MARS Walker will be able to adapt to different walking speeds and terrain with various degrees of ruggedness.

Artificial Muscles
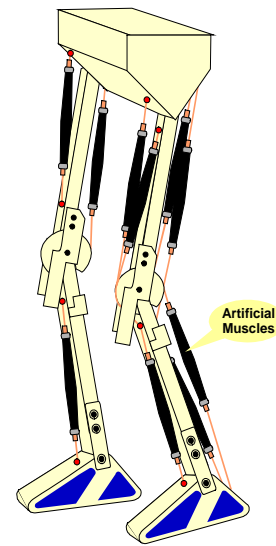
Legged robot design using anatomical and physiological data from humans