



Humanoid Robotics Design Considerations

by Karl Williams

MAKING THE CASE FOR ANTHROPOMORPHIC ROBOTS

Is it possible to create an artificial human — an android? The human body, including the brain, is one of the most sophisticated biological machines in existence. The design of the human body is so complex that, to build comparable machines, our technology would need to advance significantly. With our current understanding and technology, we can only attempt to mimic the form of the human body, since it is impossible to recreate it at this time. It is no wonder that man looks to nature for insight and inspiration when designing machines.

The idea of "reverse engineering" humans has fascinated mankind for a long time. The concept of how the human body functions has proven to be extremely complex. For example, the human hand and wrist are very complicated devices for grasping and moving objects, but, when implemented in machinery, they must be simplified in order to keep the mechanics and control systems within a reasonable level of complexity.

There are many reasons for want-

ing to create humanoid robots. Building robots that have a human form would allow those machines to take advantage of all the tools and equipment that have already been developed for humans. One of the main motivations for creating androids is the psychological aspect of human interaction with machines. We are much more comfortable communicating with machines that more closely resemble the human form, as opposed to machines that have an almost alien and sometimes frightening appearance.

How often have you heard the phrase, "It's almost human," when watching a robot do something interesting on a television show or at a science center? We humans quite often project our humanity onto machines and other life forms that resemble us. Another phrase that is heard quite often is, "It has a mind of its own," when watching an automaton perform some entertaining task or a robot that senses and responds to its environment.

People would be much more comfortable interacting with machines that are designed to look like the human form. Now that automated banking machines have eliminated most of the human tellers, wouldn't it be nice to be able to deal with banking machines in a face-to-face manner and input your data without having to fumble with a card, cramped keyboard, and a small monitor? Imagine being able to walk up to a humanoid robot, have it access your banking information via facial recognition software, and then verify your identity with a retina scan. You would be able to talk to the machine in exactly the same way that you would with a live person.

In 1942, Isaac Asimov published his three laws of robotics in a short story, called "Runaround," which was published by Street and Smith Publications. The three laws were stated as follows:

1. A robot may not injure a human being or, through inaction, allow a

