

Overview

Dr Amir Patel of UCT is using MATLAB and Simscape Multibody to develop a bipedal robot specifically designed for rapid manoeuvres.

Challenge

The robot needed to perform agile manoeuvres such as jumping and needed to be thoroughly simulated before deployment. Previously, he used V-Rep for the multibody simulation and testing of the controllers. For the robot control, a custom C# application using TwinCAT was written. However, this was not able to log at high data rates.

What We Did

A simplified model was optimised using GAMS and the IPOPT solver. These gave insights for the mechanical design of the robot. The robot was then simulated in a multibody package (V-Rep) and then the controller was deployed on the physical platform using TwinCAT.

Outcome

The robot now named Baleka can perform maneuvers of various types using MATLAB coding. MathWorks products have allowed development within one environment which is both faster and avoids unnecessary errors being introduced when moving to different development environments.

