Walking with EMO: Multi-objective robotics for evolving two, four, and six-legged locomotion

Abstract

This chapter will demonstrate the various robotics applications that can be achieved using evolutionary multi-objective optimization (EMO) techniques. The main objective of this chapter is to demonstrate practical ways of generating simple legged locomotion for simulated robots with two, four and six legs using EMO. The operational performance as well as complexities of the resulting evolved Pareto solutions that act as controllers for these robots will then be analyzed. Additionally, the operational dynamics of these evolved Pareto controllers in noisy and uncertain environments, limb dynamics and effects of using a different underlying EMO algorithm will also be discussed.