An autonomous hexapod robot crossing a water obstacle on a raft

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The article presents an algorithm for controlling the motion of a hexapod walking robot. In the simplest case it enables the robot to cross a small body of water on a rectangular raft by means of imparting an initial impulse to the raft. We chose the obstacle to be so wide so that the robot would not be able to step over it, but pushing away from land should be enough to sail a raft over it. We ran simulations in the Universal Mechanism software package to test the algorithm proposed. This package synthesises the equations of motion for a mechanical system automatically. We provide a concise description of the mathematical model used to simulate the water affecting the raft in the case of transient motion. We present computation results that validate algorithm efficiency when the motion data available is sufficient for control purposes.

Keywords: *raft, buoyancy, hydrodynamic drag, viscous friction, hexapod robot, crossing, water obstacle*

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