Preliminary work that have been done in our laboratory, to understand the mechanics and architecture of the modular snake robots. Including the study of a “rolling like a wheel” gait. The swing locomotion of hanged modular robots.

The analysis of movements of snake robots on the outside of pipes. And the design on a Discrete-Model-Predictive-Control for a 6DOF modular robot. All these approaches were done, to understand the kinematics and dynamics of a modular snake robots, and to consolidate a formal mechanical implementation.

Our current research is focused on motion planning. The purpose of this research is to formulate, implement and validate a motion planner, that selects kinematic and dynamical gait parameters to guarantee locomotion of a modular snake robot in unstructured environments, under energy efficiency, mechanical stability and performance considerations. The goal is to generate a motion planner that sets the locomotion strategies (gaits) of the modular snake robot, according to the environment, through simulation and analysis of experimental data."