

Master Thesis
IDSC-GZ-AC

Co-Design Applications in Engineering

Motivation

The recently developed mathematical theory of co-design has proved to be efficient in solving problems in fields such as mobile robotics and mobility [1-5]. We are looking forward to applying this theory to more problems in engineering. The new applications are important to establish the potential of this newly developed formalism, and will serve as explanatory examples for the new book “Applied Compositional Thinking for Engineers”, which we are writing.

Task

During the thesis, you will study the optimization techniques related to co-design, model engineering problems ranging from the design of autonomous vehicles to the design of intelligent buildings, and show the advantages of the proposed methods through case studies. Your personal interest for particular engineering domains is welcome and will be considered.

Working Packages

- Read about literature on co-design and get familiar with the code.
- Extend the catalogue of engineering applications of co-design.
- Present your result through case-studies.

Skills Required

Affinity for programming (Python), creativity, mathematics

References

- [1] A. Censi, “[A Mathematical Theory of Co-Design](#)”, 2015.
- [2] G. Zardini, N. Lanzetti, M. Salazar, A. Censi, E. Frazzoli, and M. Pavone, “[On the Co-Design of AV-Enabled Mobility Systems](#)”, 2020.
- [3] G. Zardini, N. Lanzetti, A. Censi, E. Frazzoli, and M. Pavone, “[Co-Design to friendly tools to assess the impact of future mobility solutions](#)”, 2020
- [4] G. Zardini, A. Censi, E. Frazzoli, “[Co-design of Autonomous Systems: From Selection to Control Synthesis](#)”, 2021
- [5] G. Zardini, D. Milojevic, A. Censi, E. Frazzoli, “[A formal approach to the co-design of embodied intelligence](#)”, 2021

To Apply:



Contact: Use the link <http://bit.ly/frazzoli-apply> to apply.

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