

Mini-course on optimal control with CasADi

19-21 November 2018 – Leuven, Belgium

Target audience academic/industrial researchers or tool-developers that seek practical ways to tackle large/complex continuous optimization problems, and optimal control problems in particular.

CasADi? Originating from KU Leuven's "Optimization in Engineering Center" under guidance of prof. Moritz Diehl, CasADi [1, <http://casadi.org>] is an open-source software framework for nonlinear optimization and algorithmic differentiation. It facilitates rapid - yet efficient - implementation of different methods for numerical optimal control, both in an offline context and for nonlinear model predictive control.



CasADi

Format Seminars (40%) paired with computer exercises (60%). The seminars provide a bird's-eye view on optimal control, serving as a teaser for further study or as a recap for the experienced. The computer exercises aim to deepen understanding of the theory, and leave the participants well-equipped to solve a broad range of problems using CasADi by themselves.

Covered topics Newton-type methods for constrained nonlinear programming – integration methods – direct transcription of optimal control problems (OCP) – model predictive control (MPC)

Prerequisites Basic mathematical skills (analysis, calculus, linear algebra) are required. Experience with programming in MATLAB/Octave or Python is required, unless you partner up with an experienced person.

Tutor Joris Gillis obtained his PhD in electrical engineering at KU Leuven in 2015. Currently a post-doc at MECO, KU Leuven and part-time freelancer, he pursues large-scale applications in optimal control and is highly active as a main developer of CasADi since 2010.

Practicalities The course will take place at the Park Inn hotel, Martelarenlaan 36, 3010 Leuven, Belgium, starting each day at 9:00 and ending on 18:00. A registration fee of 320 EURO excl. VAT is asked for to cover costs of venue, coffee breaks and sandwich lunches, as well as to sponsor further educational material/activities on CasADi.

Lodging is not included, but a discount rate can be obtained at the Park Inn.

Participants are required to bring their own laptops (Linux/Windows/Mac); no software is needed besides a working installation of MATLAB/Octave or Python.

Registration Register before November 1, 2018, at <http://leuven2018.casadi.org> – the event is limited to 70 participants.

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[1] Joel A. E. Andersson, Joris Gillis, Greg Horn, James B. Rawlings, M. Diehl, "CasADi – A software framework for nonlinear optimization and optimal control," Mathematical Programming Computation, 2018.