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 algorithmic differentiation, nonlinear optimization and optimal control.

Format Seminars (40%) paired with computer exercises (60%). The seminars provide a bird's-eye view on optimal control, serving as teaser for further study or as 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) – CasADi syntax

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.

Organizer Joris Gillis, joris@yacoda.com, +32496432937

[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.

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