HiGHS Newsletter 24.0

Welcome to the first HiGHS newsletter

We intend to publish two or three per year. This edition announces the first HiGHS workshop, and the new interior point solver development. For future issues we invite users to submit a brief introduction to how they are using HiGHS, possibly linked to a longer article.

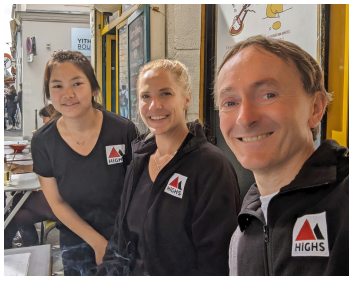
HiGHS workshop

The first HiGHS workshop will take place in Edinburgh on 27 and 28 June 2024: the end of the week before the EURO Operational Research conference in Copenhagen. With major industrial and academic users of HiGHS already committed to attending, this will be an opportunity to make connections with other HiGHS users and help shape the project's future. We are already looking forward to welcoming users to Edinburgh. For full details and registration, see workshop24.highs.dev.

Development

Having been identified as critical to developing fully open energy systems modelling, a crowdfunding campaign in 2022 yielded a donation of $420k to develop a **new interior point solver** for HiGHS. This will solve convex QP problems as well as LPs. In the summer of 2023, **Filippo Zanetti** wrote a prototype solver for LP as a workbench for developing algorithmic techniques and the necessary numerical linear algebra. Simultaneously, **Yanyu Zhou** worked with Julian as an MSc intern, assessing the performance of existing open-source solvers for both the positive definite Newton system, and the quasi-definite augmented system. Experience was also gained in the use of the Shermann-Morrison-Woodbury formula for handling LPs for which the constraint matrix contains small numbers of dense columns. **Jacek Gondzio** is bringing his decades of IPM experience to the team.

HiGHS on tour!



The HiGHS team was busy in the autumn, with Julian and Ivet meeting users at the German OR conference and INFORMS, where they picked up valuable advice on developing the interior point solver. Together with Yanyu, they attended the JuMP Optimization workshop in Paris. Julian also went to Ecuador, where he taught a course on linear optimization at ESPOL in Guayaquil, and delivered the first ever practical workshop using HiGHS.

The HiGHS team

Julian Hall

From Macclesfield, England, Julian Hall has a BA in Mathematics from the University of Oxford, a PhD from the University of Dundee supervised by Roger Fletcher and, since 1990, has been employed as a lecturer by the University of Edinburgh. Since 2018 he has developed HiGHS with Ivet Galabova, using solvers written by Edinburgh graduate students and a developer.

Ivet Galabova

From Sofia, Bulgaria, Ivet Galabova has a BSc in Computer Science, an MSc in Operational Research and Computational Optimization, and a PhD supervised by Julian Hall, all from the University of Edinburgh. Having developed HiGHS with Julian since its inception during her PhD, since 2022 she has been employed as its Integration and Development Manager.

Introducing Filippo

From Pordenone, Italy, Filippo Zanetti has a Bachelor's degree in Aerospace Engineering and Master's degree in Mathematical Engineering from the University of Padova and a PhD supervised by Jacek Gondzio from the University of Edinburgh. Since January 2024, Filippo has been employed as the HiGHS interior point developer.