Polynomial Optimization Problems in Operations Research and Finance

This PhD is funded by the Marie Curie program of European Union through the innovative training network (ITN) POEMA on polynomial optimization.

More info and positions at https://easychair.org/cfp/POEMA-19-22**.**
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Scientific context. Applications in Operations Research include logistic problems, such as developing practical approaches for the urban network clustering problem using binary polynomial optimization. The applications in Finance are centered on portfolio optimization and options pricing (in cooperation with experts in Finance at Tilburg University). We will focus on the quadratic assignment problem (QAP) and the binary portfolio optimization problem in order to provide new solution approaches for such problems.

The main tools that we employ are semidefinite programming for sum-of-squares polynomial computations, as pioneered by Lasserre and Parrilo. This includes semidefinite programming approaches for polynomial optimization, but also for the generalised problem of moments.

Working Context. The PhD candidate will be hosted by the Department of Econometrics and Operations Research of Tilburg University, The Netherlands. The team, has a strong expertise in applied operations research, and numerical optimization.

Planned secondments. The PhD candidate will have a research stay (secondments) at CNRS, Toulouse, France (3 months), and at the optimization software company ARTELYS, in Paris, France (3 months).

Required Skills. Motivated candidate should hold — at the date of recruitment — a Master's degree in Computer Science, Mathematics or Engineering (or any equivalent diploma). The applicant should have a solid background in either optimization, real algebraic geometry or computer science. Good programming skills are also a plus. Knowledge of Dutch does not constitute a pre-requisite.

The candidates are kindly asked to send an e-mail with "POEMA candidate" in the title, a CV and motivation letter to E.deKlerk@uvt.nl and to submit their documents at https://easychair.org/cfp/POEMA-19-22.