

Melissa KOENEN
PhD student Operations Research



My expertise lies in the field of optimization. Using my mathematical background within an applied setting is what I love to do the most, especially when it contributes to a better future. In my work I like to think about and work on different aspects of a problem: from discussing the underlying practical problem with field experts to setting up the corresponding mathematical formulation and evaluating its implications.

Since November 2019 I started to work as a PhD student for the Zero Hunger lab of Tilburg University. Here, we use data science to support NGOs in our joint mission towards sustainable development goal (SDG) 2: Zero Hunger. We concentrate on insightful research and advice that has as much impact as possible.

My research is heavily intertwined with ENHANCE, a grand project where we optimize diets to be affordable, nutritious and sustainable. As these factors can be contradicting, we aim to show and evaluate ecological trade-offs of healthy affordable diets. In this way we can determine how sustainable various diets are and take relevant planetary boundaries into account. This project is a collaboration between the World Food Programme (WFP), Johns Hopkins University Center for a Livable Future, Capgemini and the Zero Hunger Lab.

PERSONAL DATA

Date of Birth 06-02-1996
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RESEARCH INTERESTS

Operations research, mathematical optimization, diet optimization, multi-objective, societal impact, sustainable development goals

EDUCATION

Present	PhD in Operations Research at CentER Graduate School for Economics and Business, Tilburg University
Nov 2019	<ul style="list-style-type: none">> Department: Econometrics & Operations Research> Working title: Sustainable diet optimization algorithms> Promotor: prof. dr. ir. Hein Fleuren> Supervisor: dr. Marleen Balvert> Courses include: Data Science Methods, Orientation Research Topics in Operations Research at Tilburg University. Integer Programming Methods, Robust Optimization, Networks and Semidefinite Programming, Noncooperative Games at Dutch Network on the Mathematics of Operations Research (LNMB). Innovation Course of Dutch Coalition of Humanitarian Innovation (DCHI)
Aug 2019 Sep 2017	MSc in Operations Research and Quantitative Logistics at Erasmus University, Rotterdam <ul style="list-style-type: none">> MSc thesis combined with an internship at the Netherlands Organisation for applied scientific research (TNO). Topic related to scheduling (8.5/10)> Overall GPA: 8.4/10> Courses include: Mathematical programming, Advanced mathematical programming, stochastic models and optimization

Jul 2017 Sep 2014	BSc in Econometrics and Operations Research at Erasmus University, Rotterdam <ul style="list-style-type: none"> > Major: Quantitative Logistics > Overall GPA: 8.5/10 > Courses include: Linear programming, Combinatorial optimization, Quantitative methods for logistics > Semester abroad to Mannheim University, Mannheim > Attended Faector Excellence Programme 2017, which focused on the application of econometrics in healthcare
Jul 2014 Sep 2008	Pre-university education at Emmauscollege, Rotterdam <ul style="list-style-type: none"> > VWO, Science and Engineering/Science and Health > Overall GPA: 8.5/10 > Courses include: Mathematics, English, German > Student council member for three years

PRE-ACADEMIC WORK EXPERIENCE

August 2018 April 2018	Research Assistant at Erasmus Medical Centre, Rotterdam <ul style="list-style-type: none"> > Conducting research for four months on the Dutch screening program for Cervical Cancer > Tasks include calibrating the simulation model and modelling a new screening program
Dec 2017 Sep 2016	Student Assistant at Erasmus University Rotterdam <ul style="list-style-type: none"> > Microeconomics and Combinatorial optimization > Tasks include teaching exercise lectures, grading assignments and grading exams
Jul 2018 Sep 2015	Mentor at Erasmus University Rotterdam <ul style="list-style-type: none"> > Mentor for first year students of the Bachelor Econometrics and Operations Research > Tasks include having regular meetings with the students and explaining general procedures of the university

TEACHING ACTIVITIES

Present Nov 2019	Teaching Assistant <ul style="list-style-type: none"> > Assisted at various courses of the Bachelor Econometrics and Operations Research > Tasks include teaching exercise lectures, grading assignments and grading exams > Assisted in the courses Mathematical Analysis 1, Mathematical Analysis 2 and Operations Research Methods
November 2021 March 2021	Supervisor <ul style="list-style-type: none"> > Co-supervised a master thesis student for the Master Business Analytics and Operations Research

RESEARCH IMPACT

Present Sep 2019	Communication ENHANCE <ul style="list-style-type: none"> > With ENHANCE we aim to create an interactive application which WFP and governments can use to help to address, form and change policies > My main task is to discuss with field experts and to listen what kind of analyses they would like to perform. With this, we adjust and expand the model. A lot of communication is needed to ensure that all parties understand the idea of the problem and the solution > Tasks include attending (technical) meetings, discussing with all parties involved, informing others and giving presentations
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PUBLICATIONS

- > Koenen, M., Balvert, M., Brekelmans, R., Fleuren, H., Stienen, V., & Wagenaar, J. (2021). Forecasting the spread of SARS-CoV-2 is inherently ambiguous given the current state of virus research. PloS one, 16(3), e0245519.

ADDITIONAL INFORMATION

Conference presentations	OR Society 63
Columns/Articles	<i>Bytes voor bites; Naar een wereld zonder honger</i> , in StatOR 2021 nr 1. (page 4-8), with Marleen Balvert, Miriam Crousen, Hein Fleuren and Perry Heijne <i>ENHANCE</i> , in Nekst 2022, nr 2, with Marleen Balvert <i>Duurzaam gevoed</i> , interview together with Saskia de Pee (head analytics and science for food at WFP) in Special Zero Hunger Lab of New Scientist, March 2022
Computer skills	Python, Java, Matlab, AIMMS, R
Languages	Dutch (L1), English (C2), German (B2)

REFERENCES

prof. dr. ir. Hein Fleuren

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