

Report of the Healthcare Operations Research Summer School 2017

Dates: July 21 – 25, 2017

Location: Campus 'De Boerderij', University of Twente (participant accommodations, catering)
Ravelijn, University of Twente (lectures)
Hampshire Hotel De Broeierd (guest professors)

Organizers: Dr. Derya Demirtas (UT - CHOIR research center)
Prof.dr.ir. Erwin W. Hans (UT - CHOIR research center)
Prof.dr. Richard J. Boucherie (UT - CHOIR research center)
Ms. Elke van der Veen (UT-BMS-IEBIS secretary)

Final number of participants: 46 PhD students, 8 professors

Program overview:

<i>Day</i>	<i>Time slot</i>	<i>What?</i>
Fri, July 21	18:00-20:00	Arrival of participants, dinner, get to know each other
Sat, July 22	9:00-9:15	Opening by prof.dr.ir. Erwin Hans Tutorial prof.dr. Sally Brailsford
Sat, July 22	9:15-10:30	"You're Wanted!" - We look back at the history of OR in Healthcare, and give an overview of what has and has not been accomplished so far. Also, we outline the great challenges that current and near future healthcare faces Tutorial prof.dr. Richard Boucherie
Sat, July 22	10:30-12:00	Queuing theory in healthcare
Sat, July 22	13:00-15:45	Hybrid Simulation lecture and exercise class
Sat, July 22	15:45-18:30	Handout and explanation of serious game assignment
Sat, July 22	18:30-20:30	Dinner and brainstorm session about serious game assignment
Sat, July 22	20:30-22:30	Campus puzzle tour
Sun, July 23	9:00-11:30	Tutorial prof.dr. Brian Denton Sequential decision making in Medicine: MDPs, POMDPs, and Beyond...
Sun, July 23	11:30-12:30	Working on serious game assignment
Sun, July 23	14:00-16:30	Tutorial prof.dr. Tim Chan: Inverse Optimization Lecture and open discussion lead by prof.dr.ir. Erwin Hans
Sun, July 23	19:00-21:30	Making an impact?! - We address how to engage practice, how to organize your research to maximize impact. We also address the tension between consultancy and research, "easy solutions" and "fancy (but too complex for practice) OR".
Mon, July 24	9:00-11:00	Tutorial prof.dr. Eva Lee Machine learning and mathematical programming
Mon, July 24	11:00-22:00	Visit to Amsterdam + dinner + working on assignments
Tue, July 25	9:00-12:00	Serious Game Demonstrations (presentation of assignment results)

Report of summer school

We're looking back on a very successful Healthcare Operations Research (OR) PhD summer school, which we organized from July 21st – 25th, 2017. This year, the [INFORMS Healthcare Conference](#) was organized outside of North America for the first time and it was in Rotterdam. This event attracts hundreds of healthcare OR researchers all over the world. We took this opportunity to organize a 4-day [PhD healthcare OR summer school](#) at University of Twente right before the INFORMS Healthcare to promote the UT brand, showcase our [CHOIR](#) healthcare OR/OM research center, our research, and our departments [UT-BMS-IEBIS](#) and [UT-EWI-SOR](#).

The summer school was a huge success. We received applications from all over the world, in total over 70 applications, and accepted 46 applicants (including 9 of our own PhD students) from 17 different countries. Participants had a great experience with lectures/tutorials, inspiring talks, panel discussions, social and networking activities. We hosted four renowned speakers from leading institutions from US, Canada and the UK:

- Prof.Dr. Sally Brailsford (University of Southampton) – Chair, EURO-ORAHs working group
- Prof.Dr. Timothy Chan (University of Toronto) – Director, Centre for Healthcare Engineering
- Prof.Dr. Brian Denton (University of Michigan) – President, INFORMS
- Prof.Dr. Eva Lee (Georgia Institute of Technology) – Director, Center for Operations Research in Medicine and Healthcare

The topics included inverse optimization, queuing theory, stochastic processes, system dynamics, hybrid simulation, and machine learning, all within the healthcare research context. In addition, we organized panels and inspiring talks on making an impact in healthcare, bridging the gap between research and practice, and challenges that current and near future healthcare faces. Moreover, we designed the summer school around a serious gaming concept, and challenged participants to design their own healthcare operations research game to be used to interact with practice or teaching in classroom. They created very impressive game prototypes at the end of the short 4-day period. Participants received certificates and 2 European Credits (EC) for their attendance and preparation. Also they have received all materials that were used for the lectures/tutorials.

We aimed that this event would be affordable for all students, including the ones from developing countries. We asked for only € 50 per participant, which included accommodation on cabins on campus, food, social events and the whole program. This was made possible by the generous funding we received from 8 different sources, which covered the cost of the summer school entirely: Twente Graduate School, Universiteitsfonds, 4TU.AMI, CTIT, NGB, EURO, Star Eurandom, and GP-OML.

Overall, the summer school accomplished its goal and brought even further benefits. During the INFORMS and EURO-ORAHs conferences, which were held right after the summer school, the summer school participants were often seen together in a group. Clearly, they have bonded to a network of fellow researchers in the same career stage and within the same domain.

We advertised the summer school on several national and international channels including INFORMS Connect, INFORMS health applications society, ORAHs newsletter, EURO, SOR, CTIT, GP-OML, Star Eurandom, LNMB, and many more. This really helped to promote the UT brand, the CHOIR research group, and healthcare research focus we have at UT. We are sure that the participants will talk about their experience when they go back to their institutes, and the UT name will be known better around the globe.

Evaluation:

The summer school was an invaluable opportunity for participants to expand their knowledge, to get inspired, to network, and to reflect on the relation between research and making an impact in practice. We carried out an online feedback survey following the summer school. The survey revealed that over 90% of attendees found the content (lectures and seminars) new and interesting, and that the summer school encouraged them to consider alternative approaches to their research. 96% of them expressed that this was a great opportunity for networking, and 100% marked “strongly agree” or “agree” when asked if they enjoyed the diversity in participants’ backgrounds, research topics, and countries. Here are some testimonials from the attendees:

- “This summer school was amazing! More than anything, I appreciated the opportunity to meet other students and researchers who were interested in health care and to see what kinds of topics they were working on.”
- “The lecturers were top in their field with new and exciting research to show. I liked the dynamics of the class, it felt well balanced. We also enjoyed the extra times with the lecturers, i.e. at lunch/dinner and excursions.”
- “Networking was by far my favorite aspect of this experience. My PhD program is very small (just 9 students across 5 years), and I'm the only student working on healthcare. It was amazing to talk to other students in this area, and I definitely plan to keep in touch afterwards. The best feeling was going to INFORMS Healthcare and actually knowing people!”
- “We really appreciated how the speakers made an effort to reconnect the material in their lectures to healthcare research.”
- “Engagement level was superb in this student meeting. Although more free time would have been nice I really enjoyed making new friendships and future partnerships.”



Photos made during the summer school can be found here:

<https://www.flickr.com/photos/155963610@N03/with/36045368096/>

Overview of costs:

Catering + accommodation	€ 8,743.63
Professors (travel & accommodation)	€ 7,852.43
Lecture rooms, materials	€ 1,107.57
Excursion Amsterdam	€ 3,808.63
TOTAL	€ 21,512.26

Overview of funding:

Graduate Program Operations Management and Logistics (GP-OML)	€ 1,500
STAR Eurandom	€ 5,000
EURO	€ 3,000
CTIT	€ 3,000
Nederlands Genootschap Besliskunde (NGB)	€ 1,000
4TU.AMI	€ 2,500
Stichting Universiteitsfonds	€ 900
Twente Graduate School	€ 3,000
Participation fees – <i>received as per 25/9/2017</i>	€ 1,900
TOTAL	€ 21,500