

CHOIR STAFF

PROF.DR. RICHARD BOUCHERIE

Professor in Stochastic Operations Research; co-founder of CHOIR. Specializes in the development and application of predictive and prescriptive techniques for the optimization of decisions in healthcare delivery processes.

DR.IR. ALEIDA BRAAKSMA

Assistant Professor in Stochastic Operations Research. Specializes in developing mathematical models supporting sequential decision-making under uncertainty, with a particular focus on appointment scheduling in healthcare.

DR. DERYA DEMIRTAS

Assistant Professor in Healthcare Operations Research. Specializes in developing data-driven models aimed at improving decision making in healthcare, with a particular focus on public health resource planning and emergency response.

PROF.DR.IR. ERWIN HANS

Professor in Healthcare Operations Management; co-founder of CHOIR. Specializes in operations management and integral capacity management of healthcare organizations.



DR.IR. GRÉANNE LEEFTINK

Assistant Professor in Healthcare Operations Management. Specializes in optimizing the planning of complex healthcare processes, with a special focus to diagnostics and treatment in cancer care.

PROF.DR. NICO VAN DIJK

Professor in Stochastic Operations Research. Specializes in practical queueing analysis and simulation, with a special focus on blood inventory management.

DR.IR. MAARTJE VAN DE VRUGT

Postdoctoral researcher in Stochastic Operations Research. Also has a position at a hospital to bridge the gap between theory and practice, and focuses on Operating Room scheduling.

DR.IR. MAARTJE ZONDERLAND

Part-time researcher in Stochastic Operations Research. Works at Menzis, a major health insurance company in the Netherlands. Focuses on optimization of patient flow in hospitals.

MORE INFORMATION

Please contact us for more information about our research, education, or valorization activities via the contact details below.

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CHOIR

CENTER FOR HEALTHCARE OPERATIONS IMPROVEMENT & RESEARCH



UNIVERSITY OF TWENTE.



CENTER FOR HEALTHCARE OPERATIONS IMPROVEMENT & RESEARCH CHOIR

CHOIR IS THE DUTCH KNOWLEDGE CENTER IN THE FIELD OF HEALTHCARE LOGISTICS / OPERATIONS MANAGEMENT.

THROUGH RESEARCH, EDUCATION AND VALORIZATION, CHOIR HELPS HEALTHCARE PRACTITIONERS FACE THEIR COMPLEX LOGISTICAL CHALLENGES.

WHAT WE DO?

Healthcare institutions deal with major challenges in a constantly changing market. Since 2003, CHOIR's mission is to help healthcare institutions to improve the efficiency, quality of care and service, and quality of labor through redesigning and optimizing their processes.

Based on a fruitful tradition of research and innovation in industry and ICT, CHOIR researchers have multi-disciplinary expertise, including:

- Operations Research (OR)
- Operations Management (OM)
- Logistics
- Business Analytics
- Data Science

Through a series of more than 200 MSc projects since 2003, more than 100 publications, and 10 completed PhD projects since 2010, CHOIR has become one of the most active and productive research groups in its domain.



CHOIR's activities have three pillars: *research, education and valorization*. Through *research* we develop knowledge and answers for the complex challenges healthcare faces. Through *education* we train professionals who are much needed in the sector. Through *valorization* we support implementation of complex organizational interventions, decision support tools, and dashboard applications.

RESEARCH

CHOIR's research agenda is almost exclusively driven by the healthcare sector. We closely collaborate with healthcare organizations, where we place our researchers. This enables us to identify challenging research topics together with the problem owners. Of particular interest are problems that are experienced by other care providers as well, and problems that go beyond a single department and encompass the entire patient care path.

We use a scientific approach to design and/or optimize the planning and control of processes, and take into account each stakeholder's perspective. Stakeholder involvement is an essential condition for successful implementation. Our challenge is to balance all interests, which may include aspects like waiting time, access time, cancellations, workload pressure, overtime, utilization, one-stop-shop appointments, inventory costs, and transportation distance.

When developing organizational interventions we use mathematical models and computer simulations for prospectively testing these in a realistic



and safe environment, under various scenarios and a long horizon. This quantitative approach helps healthcare practitioners and administrators to objectify decision making, in a context where subjective decision dominates.

CHOIR researchers are active in the major international scientific networks, such as EURO-ORAHS, INFORMS Healthcare and MSOM Healthcare, and we regularly organize national and international conferences with a focus on research as well as implementation.

EDUCATION

CHOIR develops and provides education in various programs within University of Twente (UT), and for healthcare practitioners.

We offer healthcare logistics courses at UT on undergraduate and graduate levels within the Industrial Engineering & Management, Applied Mathematics, and Health Sciences programs. Students from these programs also perform graduation projects within healthcare organizations, under supervision of CHOIR staff or PhD candidates. More than 200 of such graduation projects have been done since 2003. Many alumni remain to work in healthcare after their graduation.

We offer PhD level training through the national Graduate Program Operations Management & Logistics (GP-OML), in the format of an international summer school.

We also provide a two-year post-master PDEng program in Healthcare Logistics. Its focus is on the design of high-end and innovative solutions for complex multi-disciplinary logistics problems in healthcare. The program combines academic research in an industrial context with taught modules in a range of related subjects.

To fulfill the need for training healthcare professionals, we provide tailored *in-company* training programs for healthcare managers, administrators, and clinicians. Doing these courses *in-company* allows discussing the organization's current logistical problems within the course. We address topics such as integral capacity management, hierarchical planning, variability, elementary queueing theory, and planning and scheduling. Participants are provided with free tools to bring the concepts to practice. The course duration is anywhere from 0.5 to 8 days. In its most extensive form, participants perform a logistics project parallel to the course, under supervision of CHOIR staff.

VALORIZATION

As expressed in UT's slogan "High Tech, Human Touch", valorization is in our DNA. In several ways, we strive to implement our research in practice.

We receive many requests from healthcare institutions to implement our latest developments in their operations. CHOIR provides this service through the spin-off *Rhythm*.

Rhythm is a collaboration between CHOIR and ORTEC, one of the largest providers of decision support software worldwide, with headquarters in the Netherlands. Rooted in CHOIR's research, Rhythm provides access to the latest research insights and innovations for optimization of healthcare services. Through services like consultancy, decision support software development, and business analytics, Rhythm helps healthcare providers to innovate their processes in order to deliver high quality care services efficiently and effectively.

In symbiosis, CHOIR's research feeds Rhythm with state-of-the-art knowledge, algorithms, models and techniques for implementation and dissemination in healthcare. Rhythm's activities also feed CHOIR with complex problems that drive scientific research.

Every 2-3 months, CHOIR organizes seminars and symposia to disseminate research results to practitioners, and discuss how to bring them into practice. Symposia (called "CHOIR on Tour") take place at one of the collaborating healthcare organizations.

