

Micro-Credit Course

Innovation, Disruption and Exponential Development in Medical Technologies by Prof. Michael Friebe, PhD

Healthcare — and the subset Medical Technologies / Medical Imaging — will change dramatically in the next 20 years with the emergence of artificial intelligence (including machine and deep learning), 3D printing, personalised diagnosis and therapies, shift from therapy to prevention, and many related delivery and economic changes. Huge opportunities are present in developed, emerging and developing nations ... each with completely different needs and infrastructural environments ... and with a completely different reimbursement system. The lecture will prepare the attendees for the changes that will likely come up in the coming years and subsequently focus on recognising the need for a change in our development and innovation process, that must focus on digitisation and connectivity, small footprint, robustness, and low cost ... and with that explore alternative financing methods. Due to the regulatory processes in place and the ever increasing complexity of getting products into the market there could also be lots of opportunities for reverse innovation. The lecture will also present technology approaches and some recent examples that focus on joint product developments between clinicians and engineers leading to the question of what are good versus bad value propositions for Medical Technology/Imaging Products? Following questions will be covered:

- *What actually is Innovation and can meaningful Innovation Generation for Healthcare products / services be learned? (2 hour)*
- *What are good versus bad value propositions for Medical Technology / Imaging Products? (1 hour)*
- *What likely impact will exponential technologies have on healthcare delivery / medical imaging in the next 20 years? (2 hour)*
- *What entrepreneurial opportunities will develop because of that and how do we prepare ourselves for that? (1 hour)*
- *Moonshot and MTP — set a goal and motivation for yourself (1 hour)*
- *What is reverse innovation and how can all benefit from that? (1 hour)*
- *What does it mean for University Education and future Job Descriptions (1 hour)*
- *Open discussion and Q&A session (1 hour)*
- *In between — Innovation Games (2 hour)*

The course will be given in 3 blocks and employ some games, which requires active participation and students enthusiasm. Attendees will occasionally work in small groups and present a short assignment in form of a poster.

Prof. Michael Friebe

Michael Friebe's expertise is in diagnostic imaging + image guided therapies, as founder/innovator/CEO/investor, and scientist. After a BSc. in electrical eng. he spend 5 years in San Francisco as R&D Engineer at a MRI and Ultrasound device manufacturer. In that time he graduated with a MSc. in Technology Management from Golden Gate University, San Francisco. Back in Germany he started his first company (Mobile MRI) and worked in parallel on his PhD in Medical Physics (University Witten, Germany, 1995). He has started more than 15 companies, 5 as major shareholder/CEO. He is very enthusiastic about teaching innovation generation and MedTec entrepreneurship. Dr. Friebe currently is a research fellow of TUM, Munich and a professor of Image Guided Therapies at Otto-von-Guericke-University in Magdeburg, Germany, listed inventor of more than 80 patents, author of >100 papers, board member of four medical technology startup companies, and an investment partner of a MedTec investment-fund. Since 2016 he is a Distinguished Lecturer of the IEEE EMBS.

Literature

- Christensen C, Bohmer R, Kenagy J (2000). Will Disruptive Innovations Cure Health Care? Harward Business Review 09/19 2000. <https://hbr.org/2000/09/will-disruptive-innovations-cure-health-care>
- Hendricks D. (2016) Why Entrepreneurs Are the Future of Healthcare. <http://www.inc.com/drew-hendricks/why-entrepreneurs-are-the-future-of-healthcare.html>
- De Passe JW, Caldwell A, Santorino D, et al. (2016) Affordable Medical Technologies: Bringing Value-Based Design into Global Health. BMJ Innovations, 2, 4-7.
- Friebe M (2017). International Healthcare Vision 2037 : new technologies, educational goals and entrepreneurial challenges. DOI: <https://doi.org/10.24352/UB.OVGU-2017-76>. ISBN: 978-3-944722-59-7

Day 1 (2academic hours) — proposed 03.02. 2018 (Saturday)

- Introduction to Healthcare Innovation
- What are Exponential Technologies in and for Healthcare? How will they change / impact future development strategies and business concepts?

Day 2 (2 academic hours) - proposed 04.02.2018 (Sunday)

- What will change in Healthcare and Healthcare related Product Developments? What will NOT change?
- Value Propositions of future Developments
- Introduction to entrepreneurial opportunities

Day 3 (2 academic hours) - proposed 05.02.2018 (Sunday)

- Moonshot and MTP for Healthcare (or related developments)
- Discussion of assignment

Days 4-5(4 academic hours) - proposed 05.02.2018 (Monday) - 07.02.2018 (Wednesday)

- What is reverse innovation and how can all benefit from that?
- What does it mean for University Education and future Job Descriptions
- Assignment presentation and Discussion
- Summary and Q&A

Class schedule, in February 2018, for the above may be as follows:

3rd Feb (Sat): 3.30 - 5.30 pm
4th Feb (Sun): 2.30 - 4.30 pm
5th Feb (Mon): 6 - 8 pm
6th Feb (Tue): 6 - 8 pm
7th Feb (Wed): 6 - 8 pm