

Paul Van Liedekerke | PhD

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I am a physicist by training, investigating the behavior of living and non-living systems. I develop algorithms and computer models to simulate the dynamics of granular matter, complex fluids, and biological cells/tissues) in order to understand their emergent collective behavior as we experience it every day. Generally, I am interested in numerical models and new conceptual ideas, applications from industry to medicine. I have been visiting professor at the Faculty of Engineering at KULeuven, Belgium. I am currently located in Paris.

Personal

- o Nationality: Belgian
- o Date and place of birth: 07/17/1976, Geraardsbergen

Experience

- **INRIA / Leibniz-Institut für Arbeitsforschung** **Paris / Dortmund**
Research Associate *2018 – now*
I am currently developing methodology and code for sophisticated agent-based models in a large C++ software framework called "TiSim" which will be released in 2019. These are models of a new generation that mimic the behavior of cells at a high resolution. With these models, I aim to simulate and better understand cellular (re)organization and development in embryos. This work is supported by the German Ministry of Education and Research.
- **INRIA** **Paris**
Expert Engineer (Team Mamba) *2013 – 2018*
I worked for more than five years as a senior scientist at INRIA (Institut national de recherche en informatique et en automatique). I developed so-called **agent-based** models of multi-cellular systems for the investigation of mechanical stress response in tumor spheroids and tissues, growth of avascular tumors, tissue organization and **tissue regeneration**. In the period (2013 - 2014) I was INRIA representative for the European research program NOTOX, an initiative to reduce animal testing for new drugs (<http://www.notox-sb.eu/>).

- **KULeuven and MOBA N.V.**
Engineer
Optimization and product improvement in food engineering. I implemented a fluid model to predict the draining properties of egg albumen in an automated process and applied **model-optimization** to **increase yield** as a function of machine settings and design. Bilateral project with Dutch company MOBA.
 - **EMI Fraunhofer Institute**
Visiting scientist
We implemented a simulator for **complex fluids** in the "LAMMPS" software platform (a massively parallel simulator developed at Sandia National Laboratories, US).
 - **KULeuven**
Post-doctoral researcher
Together with a research group in the computer science department of KULeuven, I developed a multi-scale modeling framework to study the **impact mechanics and bruising of tissues**. Internal KULeuven project "Multi-scale Mechanics of Fruit Tissue".
 - **KULeuven and BASF N.V.**
Research Engineer
I developed a computational model to predict **grain flow** and spread for a domestic fertilizer spreader type. The model was conceived as **designing tool** to improve granular flow spread on the field with a new conceptual spinning disc fertilizer spreader. Bilateral project with BASF, US patent 649967.
 - **KULeuven**
Research Engineer and PhD student
Model development using the Discrete Element method (DEM) (implementation in C++): I performed simulations and conducted testing experiments for the investigation of granular matter flow properties in machines. I studied advanced modeling of **multi-body dynamics and contact mechanics**. Besides this, I studied the dynamic response of vehicle suspensions with the LMS (Siemens) DADS software.

Leuven, Belgium
2011- 2012

Freiburg, Germany
Februari 2011- June 2011

Leuven, Belgium
2007- 2011

Leuven, Belgium
2006- 2007

Leuven, Belgium
2001- 2007

Education and Teaching

Academic Qualifications.....

- **Sorbonne Universités UPMC Paris VI**
Habilitation à diriger des recherches (Ingénierie)
 - **Catholic University of Leuven**
PhD in Bio-Engineering
 - **University of Ghent**
Complementary studies in Environmental Sciences
 - **University of Ghent**
Master of Physics

Paris, France
To be obtained in early 2019

Leuven, Belgium
2007

Ghent, Belgium
2000-2001

Ghent, Belgium
1995-1999

Teaching Experience.....

- **(September 2018) Invited lecturer for EU ImageInLife - Marie Curie fellowship students** *Modelling and simulation of biological development, Seignosse (France).*
- **(2013 - 2018) Visiting professor at KULeuven** *For the course "Modeling of Tissue Physiology" (Prof. H. Ramon and Prof H. Van Oosterwyck, KULeuven, Belgium).*

This is a master course teaching engineering students the basics of transport processes in cells and microscopic systems.

- **(2015-2016) Class in master course** "*Towards the systems biology of multi-cellular tissues: Single-cell-based models and beyond*" (Prof. D Drasdo, Paris IV - Jussieu).
Introduction to Agent-based models: working principles and implementation.
- **(2008 - 2009) Teaching assistant** 'For the course "*Control engineering*" - exercises (by Prof. H. Ramon, KULeuven).

Grants and prizes

- **(2013-2017) Fonds voor Wetenschappelijk Onderzoek - Vlaanderen** project : "A multilevel, integrative approach for the study of cellmatrix mechanics and mechanotransduction during cell adhesion (" (550.000 Euros, co-promotor)
- **(2013) Best Poster Award**: Odenthal, T.; Smeets, B.; Van Liedekerke, P.; Tijskens, E.; Oosterwyck, V. and Ramon, H. A DEFORMABLE CELL MODEL AND ITS APPLICATION TO INVESTIGATE INITIAL CELL SPREADING International Symposium on Computer Methods in Bio-mechanics and Biomedical Engineering.

Publications

Preprints.....

1. **Van Liedekerke P.**, J. Neitsch, T. Johann, E. Warnt, and D. Drasdo (2018) Quantifying mechanics and growth of cells in tissues using high resolution computational models (*submitted, preprint on demand*).
2. Buttenschoen A. Palm M., **Van Liedekerke P.** and D. Drasdo (2018) From biology to physics: how much can mesenchymal cell migration be attributed to pure physics? (*to be submitted, preprint on demand*).

International journals.....

3. **Van Liedekerke P.**, J. Neitsch, T. Johann, K. Alessandri, P. Nassoy and D. Drasdo (2018) Quantitative modeling identifies robust predictable stress response of growing CT-26 tumor spheroids under variable conditions. *Plos. Comp. Biol.* (*accepted*).
4. T. Heck, S. Vanmaercke, P. Bhattacharya, T. Odenthal, H. Ramon, H Van Oosterwijck and **Van Liedekerke P.** (2017) Modeling ExtraCellular matrix viscoelasticity using Smoothed Particle Hydrodynamics. *Comp. Meth. Appl. Mech. Eng.* 322(1) (*Senior co-authorship*).
5. **Van Liedekerke P.**, M. Palm, N. Jagiella and D. Drasdo (2015) Simulating tissue mechanics with Agent Based Models: concepts and perspectives *J. Comp. Part. mech* 2(4) (*Invited review*).
6. B. Smeets, T. Odenthal, J. Keresztes, S. Vanmaercke, **Van Liedekerke P.**, E. Tijskens, W. Saeys, H. Ramon, H. Van Oosterwijck (2014) Modeling contact interactions between triangulated rounded bodies for the discrete element method. *Comp. Meth. Appl. Mech. Eng.* 275(10).
7. T. Odenthal, B. Smeets, **Van Liedekerke P.**, E. Tijskens, H. Ramon, H. Van Oosterwijck (2013) Contact mechanics of adhesive triangulated bodies and application to a deformable cell model. *Plos Comp. Biol.* 9(10).
8. **Van Liedekerke P.**, T. Odenthal, B. Smeets, H. Ramon (2013) Solving microscopic flow problems using Stokes equations in SPH. *Computer Physics Communications* 184(7).
9. Bart M. Nicolai, Ashim K. Datta, Thijs Defraeye, Mulugeta A. Delele, Quang T. Ho, Linus Opara, Herman Ramon, Engelbert Tijskens, Ruud van der Sman, **Paul Van Liedekerke**, Pieter Verboven (2012). Multi-scale Modeling in Food Engineering. *Journal of Food Engineering* 277.
10. Smeets, B., Odenthal, T., Tijskens, E., Roberts, S., Tam, W., **Van Liedekerke, P.**, Van Oosterwyck, H.,

- Ramon, H. (2012). Influence of mechanics on micro-carrier cell expansion: a computational study. *Journal of Tissue Engineering and Regenerative Medicine*: vol. 6. TERMIS World Congress. Vienna, Austria, 5-8 September 2012, 391-392.
11. **Van Liedekerke P.**, Ghysels P., Tijskens E., Samaey G., Roose D. and Ramon H. (2011) The bruising of soft cellular tissue: a particle base simulation approach. *Soft Matter* 7, DOI:10.1039/C0SM01261K.
 12. **Van Liedekerke P.**, Ghysels P., Tijskens E., Samaey G., Roose D. and Ramon H. (2010) Particle based model to simulate the micro-mechanics of a spherical biological cell. *Phys. Rev. E* 81(1). **Selected for the Virtual Journal of Biological Physics Research.**
 13. **Van Liedekerke P.**, Ghysels P., Tijskens E., Samaey G., Roose D. and Ramon H. (2010) A particle based model to simulate the micro-mechanics of single plant parenchyma cells and aggregates. *Phys. Biol.* 7 026006.
 14. Ghysels P., Samaey G., **Van Liedekerke P.**, Tijskens E., Ramon H. and Roose D. (2010) Coarse implicit time integration of a cellular scale particle model for plant tissue deformation". *Int. J. Multiscale Com. Eng.* 8(4).
 15. Geris L., **Van Liedekerke P.**, Smeets B., Tijskens E., Ramon H. (2010) A cell based modeling framework for tissue engineering applications. *Journal of Biomechanics* 43, 887-892.
 16. Ghysels P., Samaey G., **Van Liedekerke P.**, Tijskens E., Ramon H. and Roose D. (2010) Multi-scale modeling of viscoelastic plant tissue. *Int. J. Multiscale Com. Eng.* 8(4).
 17. Ghysels P., Samaey G., Tijskens B., **Van Liedekerke P.**, Ramon H. and Roose D. (2009) Multi-scale simulation of plant tissue deformation using a model for individual cell mechanics. *Phys. Biol.* 6(3).
 18. **Van Liedekerke P.**, Tijskens E. and Ramon H. (2009) Discrete Element Simulations of the influence of fertilizer properties on the spread pattern from spinning disc spreaders. *Biosystems Engineering* 102 (4), 392-405.
 19. **Van Liedekerke P.**, Tijskens E., Dintwa E., F. Rioual, J. Vangeyte and Ramon H. (2008) DEM simulations of the particle flow on a centrifugal fertilizer spreader. *Powder Technology* 190(3), 348-360.
 20. **Van Liedekerke P.**, Piron E., Vangeyte J., Villette S., Ramon H. and Engelbert Tijskens (2008) Recent results of experimentation and DEM modeling of centrifugal fertilizer spreading. *Granular Matter*, 10(4), 247-255.
 21. **Van Liedekerke P.**, Tijskens E., Dintwa E., Anthonis J. and Ramon H. (2006) A discrete element model for simulation of a spinning disc fertilizer spreader. I: Single particle simulations *Powder Technology* 170(2), 71-85.
 22. Dintwa E., **Van Liedekerke P.**, Tijskens E., Ramon H. (2004) Model for simulation of particle flow on a centrifugal fertilizer spreader. *Biosystems Engineering* 87(4), 407-415.
 23. Van Zeebroeck M., Tijskens E., **Van Liedekerke P.**, Deli V., De Baerdemaeker J. and. Ramon H (2003) Determination of the dynamical behaviour of biological materials during impact using a pendulum device *Journal of Sound and Vibration* 266(3), 465-480.

Book chapters.....

- **Van Liedekerke P.**, A. Buttenschoen, D. Drasdo. "Off-Lattice Agent-Based Models for Cell and Tumor Growth: Numerical Methods, Implementation, and Applications" in *Numerical Methods and Advanced Simulation in Biomechanics and Biological processes*, published by Elsevier, to appear in 2017 (Invited chapter).
- D. Drasdo, A. Buttenschoen, **Van Liedekerke P.** "Lattice-based Agent-Based Models for Cell and Tumor Growth: Numerical Methods, Implementation, and Applications" in *Numerical Methods and Advanced Simulation in Biomechanics and Biological processes*, published by Elsevier, to appear in 2017 (Invited chapter).
- Van Liedekerke P., Vrindts E., Moshou D., Anthonis J., Bravo C., 2006. Fertilization, weed and pest control. Volume VI: Information technology. CIGR Handbook of agricultural engineering (ISBN 1-892769-54-9).
- E. Tijskens, P. Van Liedekerke, H. Ramon, "Modelling to Aid Assessment of Fertilizer Handling and Spreading Characteristics", 2005. Proceeding 553 for the International Fertilizer Society (ISBN 978-0-85310-189-5)

Short letters.....

1. Van Liedekerke P., Odenthal T. Smeets B., Ramon H. Modeling of low Reynolds flow problems using Stokes equations in SPH. 17th Spheric Newsletter, December 2013.
2. Van Liedekerke P. A combined SPH-DEM model to understand the dynamic behaviour of plant cells. 7th Newsletter, December 2008.

International conference proceedings and talks.....

1. Paul van liedekerke, "Agent-based modeling of cell and tissue mechanics: novel results on tumor growth " Saint-Andrews university Scotland, 3-5 December 2018 (**Invited talk**).
2. Paul van liedekerke, "Agent-based modeling of cell and tissue mechanics: novel results in tumor growth and invasion simulations." GDR MécaBio, Montpellier, 28-30 November 2018 (talk).
3. Paul van liedekerke, "Quantitative modeling identifies robust predictable stress response of growing CT-26 tumor spheroids under variable conditions" WCB2018, Dublin, Ireland (**Invited talk**).
4. Paul van liedekerke, "Quantitative modeling identifies robust predictable stress response of growing CT-26 tumor spheroids under variable conditions" Particles Hannover 2017, Hannover, Germany (**Invited talk**).
5. Paul van liedekerke, "Quantitative modeling identifies robust predictable stress response of growing CT-26 tumor spheroids under variable conditions". Cellmech 2017, Windermere, UK (poster presentation)
6. Paul van liedekerke, "Simulating tissue mechanics with Agent Based Models: concepts and perspectives". ECCOMAS 2016, Crete (talk)
7. Paul van liedekerke, in : Towards a unified framework for benchmarking multi-cellular models and modelling/simulation software, University of Leipzig , Germany (**Invited talk**).
8. Paul van liedekerke, Johannes Neitsch, Tim Odenthal, Bart Smeets, Herman Ramon, Hans Van Oosterwijck, Dirk Drasdo. Simulation of cell mechanics in a micropipette aspiration experiment using a highly detail model. 9th European Conference on Mathematical and Theoretical Biology (**invited talk** to minisymposium)
9. Van Liedekerke P. "Modeling of tissue at different scales using particle methods" 5th International Conference on Computational Bioengineering, ICCB2013, 11-13 September, Leuven, Belgium (talk)
10. Van Liedekerke P. "Solving Stokes equations using SPH". Third Conference on Particle-Based Methods PARTICLES 2013, 18-20 September, Stuttgart, Germany (**Invited session**).
11. Van Liedekerke P. "Particle methods for simulations in biomechanics and cell mechanics. "Multiscale mechanics group of Prof. Stefan Luding, 6 May 2013, University of Twente, The Netherlands (**Invited talk**).
12. Cardinaels, R., Van de Velde, J., Mathues, W., Van Liedekerke, P., Moldenaers, P. (2013). A rheological characterisation of liquid egg albumen. Inside Food Symposium. Leuven (Belgium), 9-12 april 2013 (pp. 1-6).
13. Van Liedekerke, Particle methods for simulations in biomechanics and cell mechanics. *University of Leipzig, IZBI, Germany, August 6, 2013. (Invited talk)*.
14. Van Liedekerke, Micromechanics in Biological Cells: a Multiscale Modeling Approach. *University of Freiburg, group Prof. Dr. Alexander Blumen, Theoretical Polymer Physics, Germany, May 4, 2011. (Invited talk)*.
15. Van Liedekerke, Micromechanics in Biological Cells: a Multiscale Modeling Approach. *2nd conference on Particle-Based Methods (PARTICLES 2011), Spain, October 26-28, 2011 (Invited session)*.
16. Abera, M., Fanta, S., Verboven, P., Van Liedekerke, P., Nicolai, B., Carmeliet, J. (2011). Virtual Fruit Tissue Generation Using Cell Growth Modelling. In Verstraeten, W. (Ed.), Coppin, P. (Ed.), Sase, S. (Ed.), Van Henten, E. (Ed.), De Melo Abreu, J. (Ed.), Acta Horticulturae: Vol. 919. International horticultural congress. Lisboa, Portugal, August 22-27, 2010 (pp. 107-114). Lisbon, Portugal: International Society for Horticultural Science.
17. Van Liedekerke, P. Multiscale applications of SPH in tissue modeling. *Forschungszentrum Juelich (Gerhard Gompper group), Germany, December 1, 2010 (Talk)*.
18. Van Liedekerke, P. Multiscale modeling of cellular tissue with particle methods. *EMI Fraunhofer intitute Freiburg, Germany, September 16, 2010. (Invited talk)*.
19. Van Liedekerke P., Ghysels P., Tijskens E. Samaey G. Roose D. and Ramon H. An SPH-DEM model to

- simulate the micromechanics of cells and tissues. ECCM 16-21 may 2010, Paris, France (Oral presentation).
20. "Particle based Simulation of agricultural and biological processes". 17-18 November 2009 , Division of Mathematics, Prof. MAJ Chaplain, University of Dundee (**Invited talk**).
 21. Van Liedekerke P., Ghysels P., Tijskens E. Samaey G. Roose D. and Ramon H. A 3D particle model to simulate the micromechanics of a spherical biological cell. Conference Particle Based Methods, 25-27 November 2009, Barcelona, Spain. ISBN 978-84-96736-82-5 (Oral presentation).
 22. Van Liedekerke P., Ghysels P., Tijskens E. Samaey G. Roose D. and Ramon H. A particle based model to simulate the dynamics of plant cells. Proceedings of the 4th Spheric Conference on Smooth Particle Hydrodynamics, May 2009, Nantes, France (Oral presentation).
 23. Van Liedekerke P., Tijskens E., Dintwa E., Vangeyte J., Ramon H., 2006. DEM for centrifugal spreaders. Multi particle simulations and validations. 2nd international symposium for fertilizer spreading, October 24-25, Montoldre, France (Oral presentation).
 24. Van Liedekerke P., Tijskens E., Dintwa E., Vangeyte J., Ramon H., 2005. Discrete element simulations for centrifugal spreaders. Single particle simulations. 1st International symposium for fertilizer spreading, September 10-11, Leuven, Belgium (Oral presentation).
 25. Tijskens E., Loodts J., Van Zeebroeck M., Van Liedekerke P., Dintwa E., Ramon H., 2005. Particle Based Simulations with DEMeter++, Acta Horticulturae No.674. Proceedings of Model-IT 2005. International symposium on applications of modelling as an innovative technology in the Agri-Food-Chain. May 29-June 2, Leuven, Belgium.
 26. Van Liedekerke P., Tijskens E., Dintwa E., Vangeyte J., Ramon H., 2004. Discrete element simulations for centrifugal spreaders. Modelling single particle trajectories . AgEng 2004 proceedings, September 12-16, leuven, Begium
 27. Vangeyte J., Sonck B., Van Liedekerke P. and Ramon H., 2004 Comparison of two methods to measure outlet velocity of fertilizer grains from a rotary disc. AgEng 2004 proceedings, September 12-16, leuven, Begium p336-337.
 28. Tijskens E., Loodts J., Van Zeebroeck M., Van Liedekerke P., Dintwa E., Ramon H., 2004. Particle Based Simulations with DEMeter++, Proceedings of Partec2004, International Conference for Particle Technology, Nuremberg, Germany, p16-18.
 29. Tijskens E., Van Zeebroeck M., Van linden M., Van Liedekerke P., Dintwa E., Ramon H., 2001. DEM Modelling of Agricultural processes: an overview of recent projects, IMACS/IFAC Fourth International Symposium on Mathematical Modelling and Simulation in Agricultural and Bio-Industries. June 12-14, Haifa, Israel.

Collaborations

- 01/07/2016- now: Experimental biology group of Frederic Lemaigre (Institut de Duve, Belgium): model for study of the development of bile ducts in embryo's.
- 01/07/2012- now: Experimental physics group of prof. Pierre Nassoy (Institute Optique, Bordeaux) on the development of the novel "Cellular Capsule Technique", to analyze the mechanical behavior and fate of tumor cells under confinement using experimental and numerical techniques.
- 01/07/2012- now: Biomechanics group of prof. Hans Van Oosterwijck (KULeuven) on the development of a computational ECM model to predict mechanical stresses during angiogenesis. Supervision of PhD student Tommy Heck.
- 01/07/2012- now: Experimental group of P. Chavrier (Institute Curie, Paris) studying invasion patterns in *in-vitro* spheroids embedded in ECM.
- 30/04/2011- 01/12/2012: R&D of company MOBA, The Netherlands.
- 2007-2011: Department of Computer Science, K.U.Leuven (Prof. D. Roose).
- 2006-2007: R&D of company BASF, Germany.
- 2001-2006: R&D of company AMAZONE WERKE, Germany and DELVANO, Belgium.

Supervising of students

PhD students.....

- Assessor of Tommy Heck (Department of Mechanical Engineering, K.U.Leuven). Study on the mechanical interaction between cells and ECM. Title to be assigned, phd degree to be obtained in 2019.
- **Co-supervisor** of Dr. ir. Bart Smeets (Department of Biosystems, K.U.Leuven). "Quantitative study on the influence of process design on the biophysical microenvironment in 3D cell cultures", phd degree obtained in 2015.
- Assessor of Yaidel Reyes Lopez (Department of Computer science, K.U.Leuven). "MPI Parallelization of particle based codes", phd degree obtained in 2014.
- **Co-supervisor** of Dr. Tim Odenthal (Department of Biosystems, K.U.Leuven). "Development of an individual cell based model of cell aggregates in bone tissue engineering", phd degree obtained in 2013.
- Assessor of Dr. Jurgen Vangeyte (Department of Biosystems, K.U.Leuven), thesis title "Development and validation of a low cost technique to predict spread patterns of centrifugal fertilizer spreaders.", phd degree obtained in 2013.
- Assessor of Dr. ir. Pieter Gyhysels (Department of Computer science, K.U.Leuven). "Multi-scale modeling of viscoelastic plant tissue", obtained 28 November 2010.

Internships.....

- Ismael Gonzales, INRIA from September 2017- December 2017.
- Eugenio Lella, INRIA from September 2014- September 2015.

Master students.....

- Supervisor of Ir. Fadil Alitinisik (K.U.Leuven, Master in BIO-Engineering), Master thesis title "Determination of cell mechanical properties by micro-pipette aspiration", degree obtained in 2011.
- Supervisor of Ir. Bart Smeets (K.U.Leuven, Master in BIO-Engineering), Master thesis title "Individual-based models of yeast colonies: a discrete element approach", degree obtained in 2010.

Organization of scientific events and memberships

- Co-organizer of a mini-symposium (cells and tissues modeling) in the 5th Particles conference in 2017, Hannover, Germany.
- Co-organizer of a mini-symposium (cells and tissues modeling) in the 4th Particles conference in 2015, Barcelona, Spain.
- Co-organizer of LMCC Workshop on "Fundamentals and applications of SPH in science and engineering" , October 25-26, 2010, Leuven, Belgium.
- Co-organizer of 1st international symposium on centrifugal fertilizer spreading, 15-16 September 2005, Leuven, Belgium.
- Membership of "SPHeric", the SPH European Research Interest Community. (<http://spheric-sph.org>)
- Membership of "Lysim", network of twenty German centers and institutions brought together by a funding program of the German Government. (www.lisym.org)

Scientific committees and evaluations

- Member of HCERES evaluation committee for the research unit "BIOSP", INRA, Avignon (France), 10/01/2017.
- Member of scientific committee for particles conference 2017-2019.
- Reviews for international journals: *Physical Biology*, *Microfluidics and Nanofluidics*, *Journal of Rheology*, *Journal of Theoretical Biology*, *Computer Physics Communications*, *Applied mathematical Modeling*, *Engineering Analysis with Boundary Elements*, *Medical Biological Engineering and Computing*, *Powder*

Technical and Personal skills

Computer.....

- **Programming Languages:** C, C++, Python, Matlab, Git.
- **OS:** Linux, Windows, Raspbian (Raspberry Pi).
- **Software:** Matlab, Scilab, Paraview (visualization), Maple, Deal.II (C++ open source package for Finite Elements).
- **Parallel computing:** OpenMP, notices of MPI. I implemented a parallel version of Smoothed Particle Hydrodynamics in LAMMPS (see http://lammps.sandia.gov/doc/PDF/SPH_LAMMPS_userguide.pdf)
- **Office:** MS Office (Excel, Word, Powerpoint), TeX, Inkscape.
- **Numerical methods:** Discrete Element Method (DEM), Smoothed Particle Hydrodynamics (SPH), Finite Element Method (FEM), Finite Differences (FD), Stochastic differential equations, Brownian motion.

Real life.....

- **Languages** Dutch (mother tongue), English (advanced), French (fluent), German (basic understanding, took a few classes).
- **Scientific dissemination:** Writing of scientific reports and giving oral presentations for government institutions and private companies. Writing of international reviewed journal papers and book chapters.
- **Hobbies:** Building Raspberry Pi projects with sensors, small domotica. Playing guitar.

Contact Persons

- Prof. Dr. Habil. D. Drasdo,
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