



Universiteit  
Leiden

The Netherlands

## Spectral imaging and tomographic reconstruction methods for industrial applications

Zeegers, M.T.

### Citation

Zeegers, M. T. (2023, May 31). *Spectral imaging and tomographic reconstruction methods for industrial applications*. Retrieved from <https://hdl.handle.net/1887/3619550>

Version: Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/3619550>

**Note:** To cite this publication please use the final published version (if applicable).

# Curriculum vitae

Mathé Thomas Zeegers was born in Alkmaar, the Netherlands, on the 3rd of May in 1992. He completed his secondary education (gymnasium) in 2010 at the Trinitas College locatie Han Fortmann in Heerhugowaard. In 2013, he obtained his bachelor degrees in Mathematics and Computer Science from Leiden University. After this, he obtained his master's degree (cum laude) in Computer Science in 2016 from Leiden University. The corresponding master thesis titled "Theoretical properties of 2048" was written under supervision of Dr. W.A. Kosters. After this, Mathé did an internship in the Life Science group at Centrum Wiskunde & Informatica (CWI), the Dutch national research institute for computer science and mathematics in Amsterdam. The result is the thesis titled "Cellular Potts modelling of branching morphogenesis by chemical inhibition and mechanochemical feedback", written under supervision of Dr. E. G. Rens and Prof. dr. R. M. H. Merks, after which Mathé obtained the master's degree for Mathematics from Leiden University in 2017. After this, he started his PhD research at the Computational Imaging group at CWI under the supervision of Prof. dr. K. J. Batenburg. During this time, Mathé conducted research in the field of spectral X-ray tomography, with links to discrete tomography, hyperspectral imaging and machine learning. During the PhD research, Mathé attend and gave talks at various venues, such as the International Workshop on Combinatorial Image Analysis (IW CIA) in Porto in 2018 and the Applied Inverse Problems (AIP) in Grenoble in 2019. He obtained a SIAM Student Travel Award in early 2020. In addition, from 2018 to early 2021, Mathé was a member of the PhD activity committee that organizes social events for PhD students, postdocs, trainees and other personnel at CWI.



# Acknowledgements

First of all, I would like to thank my promotor Joost Batenburg for not only giving me the opportunity to pursue this PhD, but also giving me a lot of freedom in the design of the resulting work. Joost, every meeting with you was something to look forward to and catalyzed the writing process so much. I am also thankful for the tremendous help from my co-promotors. I cherish to have shared the office with Daniël Pelt, teaching me so many tips and tricks over time. His critical and precise comments are reflected all over the first three chapters. Also, I thank Tristan van Leeuwen for grasping my entire projects so quickly and providing indispensable guidance and suggestions. It goes without saying that the collaboration was exceedingly smooth and pleasant.

I would also like to thank my other co-authors. Ajinkya Kadu, it is safe to say that our collaboration is one of the most pleasant I ever had. You were always available and I learned so much from you (especially about optimization). Sophia Coban, thank you for all the scanning aid (scanning was always so much fun with you around) and all the tea. I consider the trip to (Man)chester to be the highlight of the PhD. Felix Lucka, thank you for kick-starting the PhD with your help in the Multi-Channel DART project in Chapter 4. Robert van Liere, thank you for your helpful comments on Chapters 2 and 3.

I would like to thank all other Computational Imaging group members throughout the years for the great atmosphere. Giulia Colacicco\* (paranymph), thanks for all your invaluable help during the first year of the PhD and for keeping in touch afterwards. Nicola Viganò, it was always worth staying at the lunch table a little longer with you and joining the enjoyable and instructive post-lunch discussions. Džemila Šero and Georgios Pilikos, thank you for the ad hoc brainstorming and suggestions when I needed them the most. Vladyslav ‘Vlad’ Andriiashen\*, your visits to my office were always so nice thanks to your vast knowledge, admirably positive attitude - even during difficult circumstances - and your unique sense of humour.

Other members I would like to thank for their support are Alexander Skorikov, Dirk Schut, Poulami Ganguly, Hamid Fathi, Tianyuan Wang, Roozbeh Valadian, Holger Kohr, Rien Lagerwerf, Maximillian ‘Max’ Kiss, Maureen van Eijnatten, Jan-Willem Buurlage, Jordi Minnema, Richard Schoonhoven, Zhichao Zhong, Henri der Sarkissian, Alexander Kostenko, Willem Jan Palenstijn, Allard Hendriksen, Rob Bisseling, Adriaan Graas (fond AIP2019 memories), Francien Bossema, Ryan Schoop and all guest researchers.

From the Nikhef collaboration I would like to thank Martin Fransen and Navrit Bal. Navrit, while unfortunately none of our many, many experiments with Medipix directly made it into this dissertation, working with you was really enjoyable and I learned a lot in the process.

CWI has been a really nice place to carry out research, thanks to all the great people that work(ed) there. In particular, I would like to thank Nada Mitrovic, Minnie Middelberg, Bikkie Aldeias, Vera Sarkol and Remco Westra for their support and their endless kindness.

I would also like to thank the members of the PhD activity committee (including those from before and after I joined). Together with Jan Czajkowski, Esteban Landerreche, Carl Shneider, Muriel Pérez, Sanne van den Berg, Léon Ouwerkerk and other members marked by a \*, it was so pleasant to organize activities, get to know new people and bring everyone together!

In addition, there were many people I could share my research with and get any sort of feedback. For this, I thank Dorien Zwaneveld, Marco Virgolin, Karen Kokabisaghi, Arjan Cornelissen\*, Tania Bogatsch, Christopher Esterhuyse, Nikolaj Mücke, Prashant Kumar, Thomas van Binsbergen, Yllka Velaj and Srinivasan Arunachalam. Also, thanks to Lisanne Rens, Jasmijn Baaijens, Leonie van Steijn and Marleen Balvert for particularly helpful advices.

On top of this, I would like to thank Esmée Vendel for sharing the passion for music and meeting up regularly and Hemaditya Malla\* for always being available as a listening ear and to hang out with. Dean de Leo, thank you for organising CWI football and your regular cozy dinners to offer a welcome change of routine. Similarly, besides chairing the PhD activity committee in such a nice manner, I thank Mark Abspoel\* for his listening ear and the many fun after-work board games.

The activity room in CWI proved to be fertile ground for making valuable friends. I thank Isabella Pozzi\* and Ruben Brokkelkamp\* for all the notoriously hard foosball matches, but also many other great adventures beyond that. Similarly, I thank Sven Polak for all the table tennis training. And lastly, I thank Sander Gribling for advices and Skype sessions (especially in the lockdowns), and Pieter Kleer (paronymph) for occasional proofreading and house providing, and both for being respected ping pong and foosball opponents.

Lastly, Rakesh Sarma was of great help with PyTorch related issues, which were discussed among many other things during our exciting adventures: badminton, massive bike rides and watching football after work in the office. I treasure these memories.

Finally, I would like to thank Walter Kusters and Roeland Merks for their respective contributions to leading me to this PhD.

From outside CWI, I would like to thank Liam Curtin for his interest and support, and Daniëlle van der Heide for test reading and getting my mind off of work. Also, thanks to Rajesh Mahabir, Jordi Ozir, Michiel Vos and the remaining 'LIACS crew' for keeping in touch after our studies, sharing our (working) experiences and meeting up every once in a while. Similarly, I thank Dave Bleeker for his support as well. I value our long-standing friendship, and that we still catch up to share experiences and have a lot of fun!

Lastly, I would like to express my gratitude to my family. Sascha (+Gilles), Guido and Esben, thank you for your important support. Benthén, thanks for all the mathematics we share, as well as the support and fun moments throughout life. And my parents Marianne and Siem, thank you for providing the stones used in Chapter 2 and - infinitely more importantly - for your endless and unconditional love and support.



No chickens were harmed in the making of this dissertation and its associated papers.