



Universiteit
Leiden
The Netherlands

Computational optimisation of optical projection tomography for 3D image analysis

Tang, X.

Citation

Tang, X. (2020, June 10). *Computational optimisation of optical projection tomography for 3D image analysis*. Retrieved from <https://hdl.handle.net/1887/106088>

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/1887/106088>

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

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/106088> holds various files of this Leiden University dissertation.

Author: Tang, X.

Title: Computational optimisation of optical projection tomography for 3D image analysis

Issue Date: 2020-06-10

Stellingen behorende bij het proefschrift

Computational optimisation of Optical Projection Tomography for 3D image analysis

Xiaoqin Tang

1. 3D image analysis allows understanding of phenotype and internal structure of interest from a volumetric sample. It lowers the bias of the analysis but comes with considerable costs for computational resources. *This thesis*
2. Making improvements to the image acquisition process is a necessary practice, as it may take more effort to eliminate reconstruction artefacts caused by the imperfections of the imaging system and circumstances. *This thesis*
3. For the reconstruction of 3D images efficient computation is essential for the throughput of 3D image data. Successful application of the imaging can depend on fast availability of results. Therefore, a quick coarse reconstruction stands out; whilst fine-tuned results are typically achieved at the cost of computation. *This thesis*
4. Modeling and deconvolving the experimental 3D point spread function in an optical project tomography imaging system, is essential for the improvement of the image quality of the corresponding 3D image. *This thesis*
5. Improving the efficiency and accuracy of image processing, increases the reliability and prospect of automated data analysis for high-throughput large-scale imaging in biomedical research, e.g. drug discovery. *This thesis*.
6. For proper interpretation and translation of drug effects in zebrafish a 3D read-out of the distribution and quantification of a drug over time is essential.
This thesis & thesis R van Wijk (2020)
7. Annotation of anatomical domains in a zebrafish volume image provides semantic understanding. Deep learning facilitates the annotation process in terms of accuracy as well as time and labor cost. However, without specific labelling of anatomical domains deep learning is far from applicable for a complete volume annotation. *This thesis*
8. Being effective and decisive rather than just smart and perfect is, in some sense, compatible with looking for solutions instead of faults.
9. The path to obtaining a PhD is often combined with doubt and uncertainty. However, continuous exploration and self-confidence will contribute to successful completion.