

# Yiqiu Dong

Department of Applied Mathematics and Computer Science  
Technical University of Denmark  
2800 Kgs. Lyngby, Denmark  
Phone: +45 4525 3108  
E-Mail: yido@dtu.dk

## Personal Information

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**Gender:** Female

**Date of Birth:** March 22<sup>nd</sup>, 1980

**Nationality:** Chinese

## Research Interests

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- Numerical Algorithms for Tomography Reconstruction
- Mathematical Image and Video Processing
- Inverse Problems and Variational Methods
- Matrix Computation and Application
- Optimization Methods

## Google Scholar

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**Citations:** 791

**h-index:** 10

**i10-index:** 11

## Current Position

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11/2015 - Present

TECHNICAL UNIVERSITY OF DENMARK

LYNGBY, DENMARK

- Associate professor in Department of Applied Mathematics and Computer Science
- Working in ERC-project "High-Definition Tomography"



## Former Positions

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- 04/2013 – 11/2015**      **TECHNICAL UNIVERSITY OF DENMARK**      **LYNGBY, DENMARK**
- Assistant professor in Department of Applied Mathematics and Computer Science
  - Working in ERC-project "High-Definition Tomography"
- 09/2010 – 03/2013**      **HELMHOLTZ ZENTRUM MUENCHEN**      **MUNICH, GERMANY**
- Scientific researcher in Institute of Biomathematics and Biometry
  - Head of project: Prof. Stefan Kunis
- 09/2007 – 08/2010**      **UNIVERSITY OF GRAZ**      **GRAZ, AUSTRIA**
- Postdoctoral researcher in Institute of Mathematics and Scientific Computing
  - Worked in the SFB-project "Mathematical Optimization and Applications in Biomedical Sciences"
  - Head of project: Prof. Michael Hintermüller

## Education

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- 08/2006 – 07/2007**      **THE CHINESE UNIVERSITY OF HONG KONG**      **HONG KONG**
- Joint Ph.D. program with Peking University
  - Department of Mathematics
  - Supervisor: Prof. Raymond Honfu Chan
- 09/2002 – 07/2007**      **PEKING UNIVERSITY**      **BEIJING, CHINA**
- Doctor of Science
  - Department of Scientific and Engineering Computing, School of Mathematical Sciences
  - Supervisor: Prof. Shufang Xu
- 09/1998 – 07/2002**      **YANTAI UNIVERSITY**      **YANTAI, CHINA**
- Bachelor of Science
  - Department of Mathematics and Information Science.

## Skill

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- Language:      Chinese: Mother language  
                    English: Fluent; present working language  
                    Danish: Level Module 3.4  
                    German: Level A2  
                    French: Basic  
                    Cantonese: Basic
- IT:               Programming: Matlab, C++, and notions of Fortran  
                    Parallel Programming: notions of MPI and GPU technique  
                    Others: advanced user of Office tools and Latex



## Research Grant

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- 01/2013 – 12/2016, National Natural Science Foundation of China, 11271049/A0117. As co-PI. "Non-Gaussian Noise Removal in Image Restoration"

## Software Codes

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- Variational Method for Restoring Blurred Images with Multiplicative Noise, Mar. 2014.
- SA-TV: Spatially Dependent Parameter Selection for Image Restoration, Oct. 2010.
- ROLD-LITV: Efficient Two-Phase Method for impulse noise removal, Nov. 2009.
- ROLD-EPR: Statistic Noise Detector for Random-Valued Impulse Noise, Jan. 2009.
- DWM Filter: Directional Weighted Median Filter for Impulse Noise, Oct. 2008.

## Organizations

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- Chair of organizing committee for "The 6th International Conference on Scale Space and Variational Methods in Computer Vision (SSVM) 2017", 06/2017, Denmark.
- Member of organizing committee (5 members in total) for "HD-Tomo Days", 04/2016, Denmark.
- Member of organizing committee for "The Workshop on Advances in Shape and Topology Optimization", 09/2008, University of Graz, Austria.
- Minisymposium on "Non-Gaussian Noise: New Trends and Challenges", 05/2016, SIAM Conference on Imaging Science, Albuquerque, USA.
- Minisymposium on "Non-Convex Models in Image Recovery and Segmentation", 05/2014, SIAM Conference on Imaging Science, Hong Kong.
- Minisymposium on "Binary Constrained Variational Models and Algorithms in Image Processing", 05/2012, SIAM Conferences on Imaging Science, Philadelphia, USA.
- Minisymposium on "Nonsmooth Optimization and Primal-Dual Techniques in Image Restoration", 07/2008, SIAM Conferences on Imaging Science, San Diego, USA.

## Other Experiences

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- The University Teacher Teaching program at DTU (UDTU)  
Completed in 2015.
- Joint project, 10/2008 – 12/2009  
Saudi Aramco, Saudi Arabia.
- Intern, 07/2005 – 09/2005  
Microsoft Research Asia, Beijing, China.
- Reviewer for Journals  
EURASIP Journal on Applied Signal Processing, IEEE Transactions on Image Processing, IEEE Transactions on Signal Processing, IEEE Signal Processing Letters, IET Image Processing, International Journal of Numerical Analysis and Modeling, International Journal of Pattern Recognition and Artificial Intelligence, SIAM Journal on Imaging Sciences, SIAM Journal on Scientific Computing, Signal Image and Video Processing, Signal Processing, etc.



## Teaching

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- Summer School on Convex & Discrete Optimization, 08/2015  
Half-day lecture on "variational methods in image restoration".  
Technical University of Denmark and University of Copenhagen.
- Discrete Inverse Problems, 06/2015, 06/2016  
Three-week course.  
DTU Compute. Technical University of Denmark.
- Computational Science in Imaging, 01/2014, 01/2015, 01/2016  
Three-week course.  
DTU Compute. Technical University of Denmark.
- Optimization and Data-Fitting, Fall 2013  
Two-week lectures on "data-fitting".  
DTU Compute. Technical University of Denmark.
- Mathematical Image Processing, 05/2011 – 07/2011  
Two lectures and one exercise per week.  
Department of Mathematics, Technical University of Munich.
- Mathematics Laboratory, 09/2006 – 06/2007  
As teaching assistant for exercise lesson.  
Department of Mathematics, The Chinese University of Hong Kong.
- Advanced Mathematics, 09/2003 – 01/2006  
Teaching exercise lessons. Twice per week.  
School of Mathematical Sciences, Peking University.

## Supervision

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### Postdocs:

- Hans Martin Kjer  
Project: Simultaneous Reconstruction and Segmentation in X-ray Tomography (Started in Jan. 2016)

### PhD projects:

- Federica Sciacchitano  
Image Reconstruction under Non-Gaussian Noise (Started in Sep. 2013)
- Rasmus Dalgas Kongskov  
Project: Segmentation-Driven Tomographic Reconstruction (Started in Sep. 2014)
- Marie Foged Schmidt (As co-supervisor)  
Project: Prior-Driven Diffusion Regularization for Inverse Problems (Started in Dec. 2014)
- Jin-jin Mei (University of Electronic Science and Technology of China, as co-supervisor)  
Project: Sparse representation for large-scale digital image restoration problems (Started in Jan. 2014)
- Liyuan Chen (Hong Kong Baptist University, as co-supervisor)  
Project: Rician Noise Removal (finished in Dec. 2015)

### Master projects:

- Rasmus Dalgas Kongskov  
Project: Reconstruction Algorithms for Phase-Contrast Tomography Using Laboratory X-Rays (2014)

### Bachelor projects:

- Ulrik Veirup Groth  
Project: Total Variation Based Image Inpainting (2015)



## Presentations

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- 30-min talks, SIAM Conference on Imaging Science, Albuquerque, USA, May 2016.
- 50-min talk and visit, Hong Kong Baptist University, Hong Kong, Dec, 2015.
- 30-min talk, International Workshop on Signal Processing, Optimization, and Control (SPOC 2015), Guangzhou, China, Dec, 2015.
- 30-min talk, Applied Inverse Problems Conference, Helsinki, Finland, May, 2015.
- 50-min talk and visit, University of Bremen, Bremen, Germany, May, 2013.
- 50-min talk and visit, Technical University of Denmark, Lyngby, Denmark, Dec. 2012.
- 50-min talk and visit, University of Toulouse, Toulouse, France, Oct. 2012.
- 30-min talk, Workshop "Advances in Image Processing", Göttingen, Germany, Sep. 2012.
- 30-min talk, The 21st International Symposium on Mathematical Programming, Berlin, Germany, Jun. 2012.
- 30-min talk, SIAM Conference on Imaging Science, Philadelphia, USA, May 2012.
- 50-min talk, Peking University, Beijing, China, Mar. 2012.
- 50-min talk, University of Göttingen, Göttingen, Germany, Jul. 2011.
- 30-min talk, Symposium on Variational Image Analysis: Challenges and Perspectives, Heidelberg, Germany, Jul. 2011.
- 25-min talk, SIAM Conference on Optimization, Darmstadt, Germany, May 2011.
- 20-min talk, 82th Annual Meeting of the International Association of Applied Mathematics and Mechanics, University of Graz, Graz, Austria, Apr. 2011.
- 50-min talk and visit, University of Osnabrück, Osnabrück, Germany, Nov. 2010.
- 50-min talk and visit, University of Münster, Münster, Germany, Nov. 2010.
- 25-min talk, Workshop on Imaging Sciences and Medical Applications, Coimbra, Portugal, Jun. 2010.
- 50-min talk and visit, University of Liverpool, Liverpool, Britain, Apr. 2010.
- 15-min talk, SFB Status Seminar, Admont, Austria, Nov. 2009.
- 50-min talk and Visit, Nanyang Technological University, Singapore, Oct. 2009.
- 50-min talk, visit and Workshop on Computational Imaging Science, Hong Kong Baptist University, Hong Kong, Sep. 2009.
- 25-min talk, The Second International Conference on Scale Space and Variational Methods in Computer Vision, Voss, Norway, Jun. 2009.
- 20-min talk, The Third International Conference on Scientific Computing and Partial Differential Equations, Hong Kong Baptist University, Hong Kong, Dec. 2008.
- 30-min talk, SFB Status Seminar, Admont, Austria, Nov. 2008.
- 30-min talk, SIAM Conference on Imaging Science, San Diego, USA, Jul. 2008.
- 20-min talk, 79th Annual Meeting of the International Association of Applied Mathematics and Mechanics, ZARM University of Bremen, Bremen, Germany, Apr. 2008.
- 30-min talk, Sino-France Summer School and Workshop on Mathematical Methods for Multi-Channel Image Processing, Institute of Automation, Chinese Academy of Science, Beijing, China, Jul. 2006.



## Publications (Note that alphabetical listing of authors is standard in this research field)

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### Journal articles

- [1] Federica Sciacchitano, Yiqiu Dong, and Martin S. Andersen, Total variation based parameter-free model for impulse noise removal, *accepted by Numerical Mathematics: Theory, Methods and Applications*.
- [2] Mikhail Romanov, Anders Bjorholm Dahl, Yiqiu Dong, and Per Christian Hansen, Simultaneous tomographic reconstruction and segmentation with class priors, *Inverse Problems in Science and Engineering*, 2015. DOI: 10.1080/17415977.2015.1124428.
- [3] Federica Sciacchitano, Yiqiu Dong, and Tiejong Zeng, Variational approach for restoring blurred images with Cauchy noise, *SIAM Journal on Imaging Sciences*, Vol. 8, pp. 1894-1922, 2015.
- [4] Yiqiu Dong, Henrik Garde, and Per Christian Hansen, R3GMRES: including prior information in GMRES-type methods for discrete inverse problems, *Electronic Transactions on Numerical Analysis*, Vol. 42, pp. 136-146, 2014.
- [5] Yiqiu Dong, Torsten Görner and Stefan Kunis, An Algorithm for total variation regularized photoacoustic imaging, *Advances in Computational Mathematics*, Jun. 2014.
- [6] Yiqiu Dong and Tiejong Zeng, A Hybrid Variational Recovery Model for Blurred Images with Multiplicative Noise, *East Asian journal on applied mathematics*, Vol. 3, No. 4, pp. 263-282, 2013.
- [7] Yiqiu Dong and Tiejong Zeng, A Convex Variational Model for Restoring Blurred Images with Multiplicative Noise, *SIAM Journal on Imaging Sciences*, Vol. 6(3), pp. 1598–1625, 2013.
- [8] Kristian Bredies, Yiqiu Dong and Michael Hintermüller, Spatially Dependent Parameter Selection in Total Generalized Variation Model for Image Restoration, *International Journal of Computer Mathematics*, Vol. 90 (1), pp. 109-123, 2013.
- [9] Ke Chen, Yiqiu Dong and Michael Hintermüller, A Nonlinear Multigrid Solver with Line-Gauss-Seidel-Semismooth-Newton-Smoother for the Fenchel-Pre-Dual in Total Variation based Image Restoration, *Inverse Problem and Imaging*, Vol. 5(2), pp. 323-339, 2011.
- [10] Yiqiu Dong, Michael Hintermüller and M. Monserrat Rincon-Camacho, A Multi-Scale Vectorial Lt-TV Framework for Color Image Restoration, *International Journal of Computer Vision*, Vol. 92(3), pp. 296-307, 2011, DOI: 10.1007/s11263-010-0359-1.
- [11] Yiqiu Dong, Michael Hintermüller and M. Monserrat Rincon-Camacho, Automated Regularization Parameter Selection in Multi-scale Total Variation Models for Image Restoration, *Journal of Mathematical Imaging and Vision*, Vol. 40(1), pp. 82-104, 2011, DOI: 10.1007/s10851-010-0248-9.
- [12] Raymond H. Chan, Yiqiu Dong and Michael Hintermüller, An Efficient Two-Phase L1-TV Method for Restoring Blurred Image with Impulse Noise, *IEEE Transactions on Image Processing*, Vol. 19(7), pp. 1731—1739, 2010.
- [13] Yiqiu Dong, Michael Hintermüller and Marrick Neri, An Efficient Primal-Dual Method for L1-TV Image Restoration, *SIAM Journal on Imaging Sciences*, Vol. 2, pp. 1168-1189, 2009.



- [14] Yiqiu Dong, Raymond H. Chan and Shufang Xu, A Detection Statistic for Random-Valued Impulse Noise, *IEEE Transactions on Image Processing*, Vol. 16, pp. 1112-1120, 2007.
- [15] Yiqiu Dong and Shufang Xu, A New Directional Weighted Median Filter for Removal of Random-Valued Impulse Noise, *IEEE Signal Processing Letters*, pp. 193-196, March 2007.
- [16] Yiqiu Dong and Shufang Xu, An Efficient Salt-and-Pepper Noise Removal, *Journal (Natural Science) of Peking University*, pp. 604-612, Sep. 2006.

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### Conference papers

- [1] Yiqiu Dong, Michael Hintermüller and M. Monserrat Rincon-Camacho, Multiscale Total Variation Regularization in Image Restoration, *PAMM*, Vol. 11, pp. 851 – 854, 2011.
- [2] Florian Knoll, Yiqiu Dong, Michael Hintermüller and Rudolf Stollberger, Automatic Spatially Dependent Parameter Selection for TV Denoising of MR Images with Non-Uniform Noise Distribution, *VDE BMT 2010: 44. DGBMT Jahrestagung und 3-Länder Tagung D,A,CH*; Rostock, Okt. 05 - Okt. 08, 2010.
- [3] Andreas Petrovic, Yiqiu Dong, Stephen Keeling and Rudolf Stollberger, Smoothing and Interpolation of In-Vivo B1 Images, *ISMRM 18th Annual Scientific Meeting and Exhibition 2010 Proceedings*, pp. 2844, 2010.
- [4] Florian Knoll, Yiqiu Dong, Christian Langkammer, Michael Hintermüller and Rudolf Stollberger, Total Variation Denoising with Spatially Dependent Regularization for MR Images, *ISMRM 18th Annual Scientific Meeting and Exhibition 2010 Proceedings*, pp. 5088, 2010.
- [5] Yiqiu Dong and Michael Hintermüller, Multi-Scale Vectorial Total Variation with Automated Regularization Parameter Selection for Color Image Restoration, *Proceedings of the Second International Conference on Scale Space and Variational Methods in Computer Vision, Lecture Notes in Computer Science*, Vol. 5567, pp. 271-281, 2009.
- [6] Yiqiu Dong, Michael Hintermüller and M. Monserrat Rincon-Camacho, Regularization Parameter Selection in Total Variation Based Image Denoising, *PAMM*, Vol. 8, Issue 1, pp. 10931 – 10932, 2008.
- [7] Raymond H. Chan, Yiqiu Dong and Zexi Wang, A Framelet-Based Methods for Video Enhancement, Springer Lecture Notes in Electrical Engineering, *Proceedings to the International Workshop on Numerical Linear Algebra and Applications to Signals, Systems, and Control*, India, January, 2007.



## Preprints and Technical Reports

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- [1] Jinjin Mei, Yiqiu Dong, Wotao Yin and Tingzhou Huang, Cauchy noise removal by non-convex algorithm with convergence guarantee, *preprint*, 2016.
- [2] Yiqiu Dong, Paul Escande, Pierre Weiss, Contrast Invariant SNR, *preprint*, 2016.
- [3] Liyuan Chen, Yiqiu Dong, Lionel Moisan and Tieyong Zeng, A Variational Model for Restoring Blurred Images with Rician Noise, *preprint*, 2013.
- [4] Martin Burger, Yiqiu Dong and Michael Hintermüller, Exact Relaxation for Classes of Minimization Problems with Binary Constraints, *CAM Report 12-66*, Oct. 2012.