

CURRICULUM VITAE

General Information:

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Postal Address: Mathematics Department (Computer Science), Faculty of Science, Tanta University, 31527-Tanta, Egypt.

Nationality : Egyptian.

Current Positions: Associate professor of Mathematics and Computer Sciences, Mathematics Department, Faculty of Science, Tanta University, Egypt.

Professional Experience and Qualifications:

1. Bachelor of Education (B.E., Mathematics) with a general grade very good “Honour” from the Faculty of Education, Tanta University, Egypt, in 1997. Then Bachelor of Science (B.Sc., Mathematics), with a general grade Excellent “Honour” from the Faculty of Science, Tanta University, Egypt, in 2000.
2. Demonstrator in Mathematics Department, Faculty of Science, Tanta University from 2000 to 2005.
3. Assistant Lecturer in Mathematics Department, Faculty of Science, Tanta University, from 2005 till 2011 after getting the Master of Science (M.Sc.) degree in Mathematics (**Operations Research**) from the Faculty of Science, Tanta University, Egypt, in 2005 for the thesis “**A Study on Bilevel Programming Problems**”.

4. Assistant professor of Mathematics and Computer Sciences in Mathematics Department, Faculty of Science, Tanta University, from 2011 till 2023 after getting Ph.D. in 2011 from Tokushima University, Japan, for the thesis “**Continuous-time Tomographic Image Reconstruction**”.
5. Assistant professor at Taibah University, Saudi Arabia, from 2019 till now.
6. Associate professor of Mathematics and Computer Sciences in Mathematics Department, Faculty of Science, Tanta University, from 2023 till now.

Awards

1. Scholarship from the Egyptian Government to study abroad for Ph.D. degree in Tokushima University, Japan, from 2007 till 2011.
2. The Student Paper Award at NCSP'10 (2010 RISP International Workshop on Nonlinear Circuits and Signal Processing) for the paper: Chika Ueda, Omar M. Abou Al-Ola, Ken'ichi Fujimoto and Tetsuya Yoshinaga, Iterative method based on a discretization of continuous-time image reconstruction for computed tomography, Proc. of the 2010 RISP International Workshop on Nonlinear Circuits and Signal Processing, pp.223--226, Honolulu, Mar. 2010.
3. Fellowship provided by the Egyptian government for about 9 months (from April 1, 2015 to December 14, 2015) in the Department of Medical Imaging Equipment Engineering, Institute of Biomedical sciences, Tokushima University, Japan.
4. Fellowship for foreign researchers under the “Fiscal 2018 JASSO Fellow-up Research Fellowship” provided by Japan Student Services Organization (JASSO) for 90 days (from September 2, 2018 to November 30, 2018) in Tokushima University, Japan.
5. Invitation Fellowship Program for Foreign Researchers for 60 days (from July 1, 2024 to August 29, 2024) in Tokushima University, Japan, under 2024 International Exchange Program Funded by “Fujii-Otsuka International Education and Research Exchange Fund” (Invitation Fellowship).

Research interests: Operations Research, Differential Equations, Dynamical Systems, Inverse Problems, Computed Tomography, Image Reconstruction, Medical Engineering, Nonlinear System Engineering, and Algorithms.

Conferences and Forums:

1. Yusaku Yamaguchi, **Omar M. Abou Al-Ola**, Shintaro Harano, Takeshi Kojima and Tetsuya Yoshinaga : Evaluation of metal artifact reduction using dynamical image reconstruction in X-ray CT, Proceedings of International Forum of Medical Imaging in Asia, Okinawa, Jan. 2017.
2. Kiyoko Tateishi, Yusaku Yamaguchi, **Omar M. Abou Al-Ola**, Takeshi Kojima and Tetsuya Yoshinaga : Continuous analog of multiplicative algebraic reconstruction technique for computed tomography, Proceedings of SPIE, Vol.9783, San Diego, Feb. 2016.
3. Yamaguchi Yusaku, **Omar M. Abou Al-Ola**, Ken'ichi Fujimoto and Tetsuya Yoshinaga: Numerical Study of Continuous-Time Image Reconstruction for Computed Tomography, EPOS in European Congress of Radiology 2011, Wien, Mar. 2011.
4. **Omar M. Abou Al-Ola**, Ken'ichi Fujimoto, Tetsuya Yoshinaga and Kazuyuki Aihara: Common Lyapunov function for a switched nonlinear dynamical system, Proc. of the 1st International Symposium on Innovative Mathematical Modelling, p.94, 2011.
5. **Omar M. Abou Al-Ola**, Ken'ichi Fujimoto and Tetsuya Yoshinaga: Stability of a Switched System for Continuous-time Tomographic Image Reconstruction, Proc. of 2010 International Symposium on Nonlinear Theory and its Applications, pp.115--118, 2010.
6. **Omar M. Abou Al-Ola**, Ken'ichi Fujimoto and Tetsuya Yoshinaga: Properties of a switched system for continuous-time tomographic image reconstruction, Proc. of the 2010 RISP International Workshop on Nonlinear Circuits and Signal Processing, pp.219--222, 2010.
7. Chika Ueda, **Omar M. Abou Al-Ola**, Ken'ichi Fujimoto and Tetsuya Yoshinaga: Iterative method based on a discretization of continuous-time image reconstruction for computed tomography, Proc. of the 2010 RISP International Workshop on Nonlinear Circuits and Signal Processing, pp.223--226, 2010.
8. **Omar M. Abou Al-Ola**, Ken'ichi Fujimoto and Tetsuya Yoshinaga: Dynamics of Continuous-Time Image Reconstruction System for Computed Tomography, Proc. of 2009 International Symposium on Nonlinear Theory and its Applications, pp.627--630, 2009.
9. **Omar M. Abou Al-Ola**, Ken'ichi Fujimoto and Tetsuya Yoshinaga: Property of Equilibrium Existed in Continuous-Time Image Reconstruction System With Subsets for Medical Tomographic Image, Proc. of the Electronics, Information and Systems Conference Electronics, Information and Systems Society, I.E.E. of Japan, pp.951--956, 2009.
10. Ken'ichi Fujimoto, **Omar M. Abou Al-Ola** and Tetsuya Yoshinaga: Continuous Image Reconstruction for Computed Tomography Using Electronic Circuit, Proc. Of

the Electronics, Information and Systems Conference Electronics, Information and Systems Society, I.E.E. of Japan, pp.67--72, 2009.

11. Ken'ichi Fujimoto, **Omar M. Abou Al-Ola** and Tetsuya Yoshinaga: Continuous-Time Dynamical System for Reconstructing Computed Tomography Image, IEICE Technical Report, Vol.108, No.477, pp.41--46, 2009.

List of Publications:

1. **Omar M. Abou Al-Ola**, Takeshi Kojima, Ryosei Nakada, Norihisa Obata, Kohei Hayashi and Tetsuya Yoshinaga : Variable Dose-Constraints Method Based on Multiplicative Dynamical Systems for High-Precision Intensity-Modulated Radiation Therapy Planning, Mathematics, 13, 11, 1-20, 2025.

2. Norihisa Obata, **Omar M. Abou Al-Ola**, Ryosei Nakada, Takeshi Kojima and Tetsuya Yoshinaga: Variable Dose-Constraints Method for Enhancing Intensity-Modulated Radiation Therapy Treatment Planning, Mathematics, Vol.12, No.23, 1-26, 2024.

3. Takeshi Kojima, Yusaku Yamaguchi, **Omar M. Abou Al-Ola**, and Tetsuya Yoshinaga: Optimizing Parameters for Enhanced Iterative Image Reconstruction Using Extended Power Divergence, Algorithms, Vol.17, No.11, 1-14, 2024.

4. Ryuto Yabuki, Yusaku Yamaguchi, **Omar M. Abou Al-Ola**, Takeshi Kojima and Tetsuya Yoshinaga: Iterative Tomographic Image Reconstruction Algorithm Based on Extended Power Divergence by Dynamic Parameter Tuning, Journal of Imaging, Vol.10, No.8, 1-19, 2024.

5. **Omar M. Abou Al-Ola**, Ryosuke Kasai, Yusaku Yamaguchi, Takeshi Kojima and Tetsuya Yoshinaga : Image reconstruction algorithm using weighted mean of ordered-subsets EM and MART for computed tomography, Mathematics, Vol.10, 1-17, 2022.

6. Kazuki Ishikawa, Yusaku Yamaguchi, **Omar M. Abou Al-Ola**, Takeshi Kojima and Tetsuya Yoshinaga : Block-iterative reconstruction from dynamically selected sparse projection views using extended power-divergence measure, Entropy, Vol.24, No.5, 1-21, 2022.

7. Ryosuke Kasai, Yusaku Yamaguchi, Takeshi Kojima, **Omar M. Abou Al-Ola**, and Tetsuya Yoshinaga: Noise-Robust Image Reconstruction Based on Minimizing Extended Class of Power-Divergence Measures, Entropy, Vol. 23, No. 8, pp.1-16, 2021.

8. Ryosei Nakada, **Omar M. Abou Al-Ola** and Tetsuya Yoshinaga : Intensity-modulated radiation therapy optimization for acceptable and remaining-one unacceptable dose-volume and mean-dose constraint planning, Computational and Mathematical Methods in Medicine, Vol.2020, Article ID 3096067, 14 pages, 2020.

9. Yusaku Yamaguchi, Moe Kudo, Takeshi Kojima, **Omar M. Abou Al-Ola** and Tetsuya Yoshinaga: Extended ordered-subsets expectation-maximization algorithm with power exponent for noise-robust image reconstruction in computed tomography, *Radiation Environment and Medicine*, Vol.8, No.2, 2019.
10. Kimura Masashi, Yusaku Yamaguchi, **Omar M. Abou Al-Ola** and Tetsuya Yoshinaga : Tomographic Inverse Problem with Estimating Missing Projections, *Mathematical Problems in Engineering*, Vol.2019, Article ID 7932318, 11 pages, 2019.
11. Kiyoko Tateishi, Yusaku Yamaguchi, **Omar M. Abou Al-Ola** and Tetsuya Yoshinaga : Continuous analog of accelerated OS-EM algorithm for computed tomography, *Mathematical Problems in Engineering*, Vol.2017, No.1564123, pp.1--8, 2017.
12. Kiyoko Tateishi, Yusaku Yamaguchi, **Omar M. Abou Al-Ola**, Takeshi Kojima and Tetsuya Yoshinaga : Continuous analog of multiplicative algebraic reconstruction technique for computed tomography, *Progress in Biomedical Optics and Imaging - Proceedings of SPIE*, Vol.9783, 2016.
13. Ken'ichi Fujimoto, Yoshihiro Tanaka, **Omar M. Abou Al-Ola** and Tetsuya Yoshinaga: Continuous-Time Method and its Discretization to Inverse Problem of Intensity-Modulated Radiation Therapy Treatment Planning, *Communications in Nonlinear Science and Numerical Simulations*, Vol.19, pp.1996--2004, 2014.
14. Yusaku Yamaguchi, Ken'ichi Fujimoto, **Omar M. Abou Al-Ola** and Tetsuya Yoshinaga: Continuous-Time Image Reconstruction for Binary Tomography, *Communications in Nonlinear Science and Numerical Simulations*, Vol.18, No.8, pp.2081--2087, 2013.
15. **Omar M. Abou Al-Ola**, Ken'ichi Fujimoto and Tetsuya Yoshinaga: Common Lyapunov Function Based on Kullback—Leibler Divergence for a Switched Nonlinear System, *Mathematical Problems in Engineering*, Vol.2011, No.723509, 2011.
16. Ken'ichi Fujimoto, **Omar M. Abou Al-Ola** and Tetsuya Yoshinaga: Implementation of Continuous-time Image Reconstruction System in Analog Electronic Circuit, *Far East Journal of Electronics and Communications*, Vol.6, No.1, pp.13--25, 2011.
17. **Omar M. Abou Al-Ola**, Ken'ichi Fujimoto and Tetsuya Yoshinaga: Block Continuous-time Image Reconstruction for computed tomography, *Far East Journal of Dynamical Systems*, Vol.14, No.1, pp.51--70, 2010.
18. Chika Ueda, **Omar M. Abou Al-Ola**, Ken'ichi Fujimoto and Tetsuya Yoshinaga: Iterative Method Based on a Discretization of Continuous-Time Image Reconstruction for Computed Tomography, *Journal of Signal Processing*, Vol.14, No.4, pp.293--296, 2010.
19. Ken'ichi Fujimoto, **Omar M. Abou Al-Ola** and Tetsuya Yoshinaga: Continuous-Time Image Reconstruction Using Differential Equations for Computed Tomography,

Communications in Nonlinear Science and Numerical Simulations, Vol.15, No.6,
pp.1648--1654, 2010.

20. Ebrahim A. Youness, and **Omar M. Abo Al-Olaa**: On Quasi E-convex Bilevel Programming Problem, American Journal of Applied Sciences, vol.2, pp.565--568, 2005.