Jan Harold Mercado Alcantara

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🌐 jhalcantara.github.io

Research Interests

Continuous Optimization, Feasibility Problems, Variational Inequalities

Education

Doctor of Philosophy in Mathematics	02/2018 - 06/2020

National Taiwan Normal University
Dissertation: Dynamical Systems Approach to Complementarity Problems
Adviser: Prof. Jein-Shan Chen

Master of Science in Mathematics	05/2013 - 04/2015

De La Salle University

Bachelor of Secondary Education major in Mathematics	05/2009 - 09/2012

De La Salle University

Academic Experience

Visiting Scholar	08/2022 - 10/2022

Department of Mathematics, National University of Singapore
Host collaborator: Prof. Kim-Chuan Toh

Postdoctoral Scholar	08/2021 - present

Institute of Statistical Science, Academia Sinica
Supervisor: Dr. Ching-pei Lee

Postdoctoral Fellow	08/2020 - 07/2021

Department of Mathematics, National Taiwan Normal University
Supervisor: Prof. Jein-Shan Chen

Teaching Experience

Assistant Professor	01/2017 - 12/2017

Mathematics and Statistics Department, De La Salle University

Teaching Associate	01/2016 - 12/2016

Mathematics and Statistics Department, De La Salle University

Lecturer	08/2015 - 12/2015

Mathematics and Statistics Department, De La Salle University

Lecturer	06/2015 - 10/2015
	11/2012 - 03/2013

Mathematics Department, Adamson University

- **Courses taught**

Graduate courses: Linear Algebra and Calculus
Undergraduate courses: Abstract Algebra, Differential Equations, Differential Calculus, Integral Calculus, Multivariable Calculus, Differential Equations, Algebra and Trigonometry

Publications

Journal Articles

1. **Alcantara, Jan Harold**, Chen, Jein-Shan, and Tam, Matthew K., "Method of alternating projections for the general absolute value equation", to appear in *Journal of Fixed Point Theory and Applications* (2022).

2. **Alcantara, Jan Harold** and Chen, Jein-Shan, "A new class of neural networks for NCPs using smooth perturbations of the natural residual function", *Journal of Computational and Applied Mathematics*, vol. 407, 114092 (2022).

3. Sun, Juhe, Fu, Weichen, **Alcantara, Jan Harold**, and Chen, Jein-Shan, "A neural network based on the metric projector for solving SOCCVI problem", *IEEE Transactions on Neural Networks and Learning Systems*, vol. 32, no. 7, pp. 2886–2900 (2021).

4. Wu, Caiying, Wang, Jing, **Alcantara, Jan Harold**, and Chen, Jein-Shan, "Smoothing strategy along with conjugate gradient algorithm for signal reconstruction", *Journal of Scientific Computing*, vol. 87, no. 1, Article 21 (2021).

5. **Alcantara, Jan Harold** and Chen, Jein-Shan, "A novel generalization of the natural residual function and a neural network approach for the NCP", *Neurocomputing*, vol. 413, pp. 368–382 (2020).

6. **Alcantara, Jan Harold**, Lee, Chen-Han, Nguyen, Chieu Thanh, Chang, Yu-Lin, and Chen, Jein-Shan, "On construction of new NCP functions", *Operations Research Letters*, vol. 48, pp. 115–121 (2020).

7. **Alcantara, Jan Harold** and Chen, Jein-Shan, "Neural networks based on three classes of NCP-functions for solving nonlinear complementarity problems", *Neurocomputing*, vol. 359, pp. 102–113 (2019).

8. **Alcantara, Jan Harold**, Lao, Angelyn, and Ruivivar, Leonor, "Stability analysis of the ODE model representation of amyloidogenic processing in Alzheimer's disease in the presence of SORLA", *Molecular BioSystems*, vol. 12, pp. 1468–1477 (2016).

Preprints

9. **Alcantara, Jan Harold** and Lee, Ching-pei, "Global convergence and acceleration of fixed point iterations of union upper semicontinuous operators: proximal algorithms, alternating and averaged nonconvex projections, and linear complementarity problems", arXiv:2202.10052, submitted (2022).

10. **Alcantara, Jan Harold** and Lee, Ching-pei, "Accelerated projected gradient algorithms for sparsity constrained optimization problems", submitted (2022).

11. Nguyen, Chieu Thanh, **Alcantara, Jan Harold**, Okuno, Takayuki, Takeda, Akiko, and Chen, Jein-Shan, "Unified smoothing approach for best hyperparameter selection problem using a bilevel optimization strategy", arXiv:2110.12630 (2021).

12. Nguyen, Chieu Thanh, **Alcantara, Jan Harold**, Lu, Yue, and Chen, Jein-Shan, "Penalty and barrier methods for convex and nonconvex second-order cone programming", submitted (2021).

In Preparation

13. Nguyen, Chieu Thanh, Hao, Zijun, **Alcantara, Jan Harold**, and Chen, Jein-Shan, "A p-power penalty approach for solving second-order cone complementarity problems".

14. Nguyen, Chieu Thanh, Santos, Bernadette Louise, **Alcantara, Jan Harold**, and Chen, Jein-Shan, "Smoothing functions for nonsmooth regularizers".

15. Miao, Xin-He, **Alcantara, Jan Harold**, and Chen, Jein-Shan, "A Gauss-Seidel type method for solving $\ell_2 - \ell_p$ minimization"

16. **Alcantara, Jan Harold** and Chen, Jein-Shan, "An efficient and accurate solver for large-scale sparse recovery problems using a conjugate gradient algorithm for a class of smooth nonconvex regularizers".

Conference Talks

o "Method of alternating projections for solving absolute value equations", Contributed talk at the International Conference on Continuous Optimization, Pennsylvania, USA, July 2022.

o "Proximal algorithms for a class of nonconvex nonsmooth minimization problems involving piecewise smooth and min-weakly-convex functions", Invited Speaker for the Special Session of 2021 Taiwan Mathematical Society Annual Meeting, Taipei, Taiwan, January 2022.

o "Neural networks based on three classes of NCP-functions for solving nonlinear complementarity problems", Oral presentation delivered at Taiwan Mathematical Society Annual Meeting, Taipei, Taiwan, December 2018.

o "The dynamics of a breast cancer model with Raphanus sativus extract", Oral presentation delivered at the 2017 Mathematical Society of the Philippines Annual Convention, Legazpi City, Philippines, May 2017.

o "The dynamics of SORLA's influence on amyloidogenic processing", Oral presentation delivered at the 2016 Mathematical Society of the Philippines Annual Convention, Cebu City, Philippines, May 2016.

o "Stability Analysis of the ODE Model Representation of Amyloidogenic Processing in Alzheimer's Disease in the presence of SORLA", Oral presentation delivered at the 3rd Asian Regional Conference on Systems Biology (ARCSB2015-TriSys), Selangor, Malaysia, September 2015.

Invited Talks

o "Projection methods for feasibility problems", DLSU Mathematics and Statistics Lecture Series, De La Salle University, Manila, Philippines, August 2021.

o "Smooth nonconvex regularizers for sparse recovery problems and an efficient conjugate gradient algorithm", 2020 National Center for Theoretical Sciences Optimization Day for Young Researchers, National Taiwan Normal University, Taipei, Taiwan, December 2020.

o "Smoothed neural networks for nonlinear complementarity problems", Workshop on Advances in Continuous Optimization, University of Tokyo, Tokyo, Japan, September 2019.

Invited Lectures

o "Qualitative Analysis of Solutions and Introduction to Bifurcation", DLSU Mathematics Lecture Series, Manila, Philippines, 2017.

o "On Stability and Bifurcation Analysis", First Lecture Series for AY2016-2017, Mathematical Society of the Philippines – National Capital Region held at Mapua Institute of Technology 2016.

o "Mathematical Modelling of Dynamical Systems: Stability Analysis of ODE Models", DLSU Mathematics Lecture Series, Manila, Philippines, 2016.

Professional Service

Reviewer:

o Journal of Applied Mathematics and Computing

o Neural Computing and Applications

o Journal of Computational and Applied Math

o Pacific Journal of Optimization

o Journal of Global Optimization

o Taiwanese Journal of Mathematics