Zin Arai

Professor

Department of Mathematical and Computing Science School of Computing Institute of Science Tokyo 2-12-1, Ookayama, Meguro-ku, Tokyo 152-8552 email: zin@comp.isct.ac.jp website: http://www.zinarai.org/ Birth-date and Place: July 22, 1975; Tokyo, Japan

Education

2003	Ph.D.	Kyoto University
2000	M.S.	Kyoto University
1998	B.S.	Kyoto University

Employment

2023 Apr Present	Professor
	Tokyo Institute of Technology
2017 Apr 2023 Apr.	Professor
	Chubu University Academy of Emerging Sciences
2011 Oct 2017 Mar.	Associate Professor
	Department of Mathematics, Hokkaido University
2008 Aug 2011 Sep.	Assistant Professor
	Creative Research Institution, Hokkaido University
2007 Sep 2011 Mar.	PRESTO Researcher
	Japan Science and Technology Agency
2003 July - 2008 July	Assistant Professor
	Department of Mathematics, Kyoto University
2003 Apr - Jun	JSPS Postdoctoral Fellow

Activities

2020 Jan. - PresentExecutive Committee,
East Asia Section of Society for Industrial and Applied Mathematics2021 Jan. - PresentEditorial Board, SIAM Journal of Applied Dynamical Systems

Selected Publications

- [1] H. Koda, Z. Arai, and I. Matsuda, Agent-based simulation for reconstructing social structure by observing collective movements with special reference to single-file movement, *PLOS ONE*, December 3, 2020. https://doi.org/10.1371/journal.pone.0243173
- [2] T. Tsutsumi, Y. Ono, <u>Z. Arai</u>, and T. Taketsugu, Visualization of the Dynamics Effect: Projection of on-the-Fly Trajectories to the Subspace Spanned by the Static Reaction Path Network, J. Chem. Theory Comput. 16(7) (2020), 4029—4037. https://doi.org/10.1021/acs.jctc.0c00018
- [3] Z. Arai, Y. Ishii and H. Takahasi, Boundary of the horseshoe locus for the Hénon family, SIAM Journal on Applied Dynamical Systems 17-3 (2018), 2234-2248, DOI: 10.1137/18M1174684
- [4] T. Tsutsumi, Y. Ono, <u>Z. Arai</u> and T. Taketsugu, Visualization of the intrinsic reaction coordinate and global reaction route map by classical multidimensional scaling, *J. of Chem. Theory Comput.* 14(8) (2018), 4263–4270, DOI: 10.1021/acs.jctc.8b00176
- [5] <u>Z. Arai</u> and Y. Ishii, On parameter loci of the Hénon family, *Communications in Mathematical Physics* 361(2) (2018), 343–414, DOI: 10.1007/s00220-018-3174-0
- [6] <u>Z. Arai</u>, On loops in the hyperbolic locus of the complex Hénon map and their monodromies, *Physica D* 334 (2016), 133–140.
- [7] <u>Z. Arai</u>, Decomposition and clustering for the visualization of dynamical systems, *Mathematical Progress in Expressive Image Synthesis I*, Springer (2014), 13–20.
- [8] <u>Z. Arai</u>, A rigorous numerical algorithm for computing the linking number of links, *Nonlinear Theory and Its Applications* 4:1 (2013), 104–110.
- [9] Z. Arai, M. Gameiro, T. Gedeon, H. Kokubu, K. Mischaikow, and H. Oka, Graph-based topological approximation of saddle-node bifurcation in maps, *RIMS Kokyuroku Bessatsu*, B 31 (2012), 225–241.
- [10] <u>Z. Arai</u>, H. Kokubu and I. Obayashi, Capturing the global behavior of dynamical systems with Conley-Morse graphs, *Advances in Cognitive Neurodynamics* (III) (2012), Springer, 665–672.
- [11] <u>Z. Arai</u>, K. Hayashi and Y. Hiraoka, Mayer-Vietoris sequences and coverage problems in sensor networks, *Japan Journal of Industrial and Applied Mathematics* 28 (2011), 237–250,

- [12] Z. Arai, W. Kalies, H. Kokubu, K. Mischaikow, H. Oka and P. Pilarczyk, A Database Schema for the Analysis of Global Dynamics, AIP Conference Proceedings 1168 (2009), 918, https://doi.org/10.1063/1.3241632
- [13] Z. Arai, W. Kalies, H. Kokubu, K. Mischaikow, H. Oka and P. Pilarczyk, A database schema for the global dynamics of multi-parameter systems, *SIAM Journal on Applied Dynamical Systems* 8 (2009), 757–789.
- [14] Z. Arai, H. Kokubu and P. Pilarczyk, Recent development in rigorous computational methods in dynamical systems, *Japan Journal of Industrial and Applied Mathematics* 26 (2009), 393–417.
- [15] <u>Z. Arai</u>, Hyperbolicity, stability and monodromy of dynamical systems, *PAMM*, 7 (2007), Special Issue: Sixth International Congress on Industrial Applied Mathematics (ICIAM07).
- [16] <u>Z. Arai</u>, On hyperbolic plateaus of the Hénon map, *Experimental Mathematics* 16:2 (2007), 181–188.
- [17] Z. Arai and K. Mischaikow, Rigorous computations of homoclinic tangencies, SIAM Journal of Applied Dynamical Systems 5 (2006), 280–282.
- [18] Z. Arai, Equivalence of graded module braids and interlocking sequences, *Journal of Mathe-matics of Kyoto University* 43 (2003), 441–449.
- [19] <u>Z. Arai</u>, Tangencies and the Conley index, *Ergodic Theory & Dynamical Systems* 22 (2002), no. 4, 973–999.