

Zin Arai

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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. - Present	Executive Committee, East Asia Section of Society for Industrial and Applied Mathematics
2021 Jan. - Present	Editorial 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, Z. Arai, 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, Z. Arai 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] Z. Arai 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] Z. Arai, On loops in the hyperbolic locus of the complex Hénon map and their monodromies, *Physica D* **334** (2016), 133–140.
- [7] Z. Arai, Decomposition and clustering for the visualization of dynamical systems, *Mathematical Progress in Expressive Image Synthesis I*, Springer (2014), 13–20.
- [8] Z. Arai, 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] Z. Arai, 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] Z. Arai, 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] Z. Arai, Hyperbolicity, stability and monodromy of dynamical systems, *PAMM*, **7** (2007), Special Issue: Sixth International Congress on Industrial Applied Mathematics (ICIAM07).
- [16] Z. Arai, 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 Mathematics of Kyoto University* **43** (2003), 441–449.
- [19] Z. Arai, Tangencies and the Conley index, *Ergodic Theory & Dynamical Systems* **22** (2002), no. 4, 973–999.