

Soichiro Tsuda

Current Appointments

Leverhulme Trust Research Fellow
University of the West of England
Faculty of Environment and Technology
Frenchay Campus, Coldharbour Lane
Bristol, BS16 1QY, United Kingdom

Visiting Researcher
University of Southampton
School of Electronics and Computer Science
Nano Group / Science and Engineering of Natural Systems Group
University Road, Southampton SO17 1BJ, United Kingdom

Personal Details

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Address(Home): 3 Oakdale Road, Bristol, BS16 6DP, United Kingdom
Date of birth: 26.07.1979
Nationality: Japanese
Marital Status: Married
Language: Japanese (mother tongue), English (fluent)

Qualifications

PhD in Biology, Robot Control with Biological Cells, Kobe University, 2007

MSc in Computer Science, Development and Emergent Solution in *Physarum* Logic Gate, Kobe University, 2004

BSc in Biology, Kobe University, 2002

Academic Appointments

August 2009 – present

Leverhulme Trust Research Fellow, Faculty of Environment and Technology, University of the West of England Bristol

January 2007 – July 2009

Postdoctoral Research Fellow, Department of Electronics and Computer Science, University of Southampton

April 2004 – March 2006

Student Research Associate, Graduate School of Science and Technology, Kobe University

Publications

Journal Articles

- S. Tsuda**, K.-P. Zauner and H. Morgan (2010) Long-term storable microfluidic whole-cell biosensor based on impedance measurement. (submitted)
- S. Tsuda** and J. Jones and A. Adamatzky (2010) Towards *Physarum* engines. (submitted)
- S. Tsuda** (2010) Emergence and collapse of order in mutually imitating agents. (submitted)
- S. Tsuda**, J. Jones (2010) The Emergence of Synchronization Behavior in *Physarum polycephalum* and its Particle Approximation, *Biosystems* (in press)
- T. Sun*, **S. Tsuda***, K.-P. Zauner and H. Morgan (2009) On-chip electrical impedance tomography for imaging biological cells, *Biosensors and Bioelectronics*, 25(5), pp.1109–1115. (*: double first author)
- S. Tsuda** (2009) Robot with slime ‘brains’. *Technoetic Arts*, 7(2), pp.133–140
- J. Gough, G. Jones, C. Lovell, P. Macey, H. Morgan, F. Revilla, R. Spanton, **S. Tsuda**, and K.-P. Zauner (2009) Integratiofn of Cellular Biological Structures Into Robotic Systems. *Acta Futura*, 3, pp.43–49.
- S. Tsuda**, K.-P. Zauner and Y.-P. Gunji (2007) Robot control with biological cells. *Biosystems*, 87, pp.215–223.
- S. Tsuda**, K.-P. Zauner and Y.-P. Gunji (2006) Robot Control: From Silicon Circuitry to Cells, Lecture Notes in Computer Science, Volume 3853/2006, pp.20–32.
- S. Tsuda**, M. Aono and Y.-P. Gunji (2004) Robust and emergent *Physarum* logical-computing. *Biosystems*, 73 . pp.45–55.

Book Chapters (all invited contribution)

- S. Tsuda** (2011) Microfluidic Wholecell Biosensor, *Encyclopedia of Nanotechnology*, Springer-Verlag London.
- S. Tsuda** (2011) Nanorobotics, *Encyclopedia of Nanotechnology*, Springer-Verlag London.
- S. Tsuda** (2011) Molecular Computing, *Encyclopedia of Nanotechnology*, Springer-Verlag London.
- S. Tsuda** (2011) Synthetic Biology, *Encyclopedia of Nanotechnology*, Springer-Verlag London.
- J. Jones, **S. Tsuda** and A. Adamatzky (2011) Towards *Physarum* Robots. In: Bio-Inspired Self-Organizing Robotic Systems, Studies in Computational Intelligence series, Springer-Verlag. (in press)
- S. Tsuda**, S. Artmann and K.-P. Zauner (2009) The Phi-Bot: A Robot Controlled by a Slime Mould. In: Artificial Life Models in Hardware, pp.213–232, Springer-Verlag London.

Conference Proceedings (Peer-reviewed)

- S. Tsuda**, J. Jones (2010) The Emergence of Complex Oscillatory Behaviour in *Physarum polycephalum* and its Particle Approximation. In: Artificial Life XII: Proceedings of the Twelfth International Conference on the Simulation and Synthesis of Living Systems, 19–23 August 2008, Odense, Denmark, MIT Press, pp.698–705.
- T. Sun, **S. Tsuda**, K.-P. Zauner and H. Morgan (2009) Single cell imaging using electrical impedance tomography. In: 4th IEEE International Conference of Nano/Micro Engineered and Molecular Systems, 5–8 January 2009, Shenzhen, China.

S. Artmann, **S. Tsuda** and K.-P. Zauner (2008) Information-Theoretic Aspects of Control in a Bio-Hybrid Robot Device. In: Artificial Life XI: Proceedings of the Eleventh International Conference on the Simulation and Synthesis of Living Systems, pp.33–40, MIT Press.

S. Tsuda, K.-P. Zauner and Y.-P. Gunji (2006) Computing Substrates and Life. In: Explorations in the Complexity of Possible Life: Abstracting and Synthesizing the Principles of Living Systems – Proceedings of the 7th German Workshop on Artificial Life, 26–28 July 2006, Jena, Germany. IOS Press. pp.39–49,

S. Tsuda, K.-P. Zauner and Y.-P. Gunji (2005) Robot Control with Biological Cells. In: Sixth International Workshop on Information Processing in Cells and Tissues, 30 August–1 September, 2005, St. William’s College, York, UK. pp.202–216.

S. Tsuda, M. Aono and Y.-P. Gunji (2003) Robust and emergent Physarum logical-computing. In: The Shanghai International Conference on Nonlinear Science and Applications, Shanghai, November 12–14 2003.

Conference Proceedings (Non-peer-reviewed)

S. Tsuda (2009) Physarum chip: An interface between cellular ‘brain’ and artificial devices. In: Proceedings of Unconventional Computing 2009 Satellite Workshop on Novel Computing Substrate, 7–11 September 2009, Ponta Delgada (Azores), Portugal

T. Sun, **S. Tsuda**, K.-P. Zauner and H. Morgan (2009) Electrical impedance imaging of biological cells in culture. In: Dielectrics 2009: Measurement ANalysis and Applications, 40th Anniversary Meeting, 15–17 April 2009, University of Reading, UK.

T. Sun, **S. Tsuda**, K.-P. Zauner and H. Morgan (2008) On-chip electrical impedance tomography for 2D imaging of cells. In: 12th Annual European Conference on Micro & Nanoscale Technologies for Biosciences, 16–19 November 2008, Montreux, Switzerland.

T. Sun, **S. Tsuda**, N.G. Green, K.-P. Zauner and H. Morgan (2008) On-chip Electrical Impedance Tomography for Monitoring the Kinetics in the Cell Culture. In: The 12th International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS 2008), 12–16 October, 2008, San Diego Sheraton Hotel & Marina, San Diego, California, USA.

S. Tsuda, T. Sun and H. Morgan (2008) On-chip Electrical Impedance Tomography For Single Cell Imaging, Bioengineering 08, 18–19 September 2008, South Kensington Campus, Imperial College London, UK.

T. Sun, **S. Tsuda**, N.G. Green, and H. Morgan (2008) Lab-on-a-chip technology for single cell manipulation and characterization using electrical methods. In: Physics Meets Biology Conference, Institute of Physics, 13–16 July 2008, University of Oxford, UK.

S. Tsuda, K.-P. Zauner and Y.-P. Gunji (2007) Real-time Requirements and Restricted Resources: The Role of the Computing Substrate in Robots. In: International Conference on Morphological Computation, 26–28 March 2007, European Center of Living Technology (ECLT), Venice Italy. pp.33–35.

Invited Talks

S. Tsuda, Complex Patterns in Imitating Cellular Automata”, Workshop on New Materials for the Bottom Up Assembly of Architecture, 19 August 2010, Odense, Denmark

S. Tsuda, as panelist at 30-second Commute, SCI-FI London, 1–3 May 2010, London

S. Tsuda, Unconventional Computing with Living Cells, Ecobuild, 1–3 March 2010, London

S. Tsuda, *Physarum* Technology, Unconventional Computing & Architecture Conference/Workshop, 26–27 February 2010, London

S. Tsuda, *Physarum* chip: An interface between cellular ‘brain’ and artificial devices, Unconventional Computing 2009 Satellite Workshop on Novel Computing Substrate, 7–11 September 2009, Ponta Delgada (Azores), Portugal

Academic Activities

A principal organiser of **The First International Workshop on Computing with Spatio-temporal Dynamics (CSD10)**, 21–25 June 2010, University of Tokyo, Japan
<http://arn.local.frs.riken.jp/CSD10/>

A member of Program Committee of **The 12th International Conference on the Synthesis and Simulation of Living Systems (Artificial Life XII)**, 19–23 August 2010, Odense, Denmark
<http://www.alifexii.org/>

A member of Advisory Committee of **Unconventional Computing 2009 Satellite Workshop on Novel Computing Substrate**, 7–11 September 2009, Ponta Delgada (Azores), Portugal
<http://uncomp.uwe.ac.uk/ncs09/>

Awards and Grants

Daiwa Foundation Small Grants for “The First International Workshop on Computing with Spatio-temporal Dynamics (CSD10)”, £2,000, The Daiwa Anglo-Japanese Foundation, 2009

Daiwa Foundation Small Grants for “The first UK-Japan *Physarum* meeting”, £2,000, The Daiwa Anglo-Japanese Foundation, 2008

The Hara Research Foundation Fellowship Award, Travel grant for “The Sixth International Workshop on Information Processing in Cells and Tissues (IPCAT 2005)”, 130,000 yen, The Hara Research Foundation, 2005

Japan Student Services Organization (JASSO) Scholarship Award (sponsorship), Japanese Ministry of Education, 2004–2007