Robert Brijder Curriculum Vitae

Dr. R. Brijder
Leiden University
Leiden Institute of Advanced
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Date of birth: November 5, 1980
Place of birth: Delft, The Netherlands
Nationality: Dutch

Education

- **Ph.D. student in Computer Science** Sep. 2004 – Aug. 2008
  Received Ph.D. in Dec. 2008.
  Ph.D. student in Theoretical Computer Science at Leiden Institute of Advanced Computer Science (LIACS). Main research topics are: The formal study of Gene Assembly in Ciliates, Membrane Computing, and Self-Assembly.
  Ph.D. thesis title: *Models of Natural Computation: Gene Assembly and Membrane Systems*. Promotor: Prof. G. Rozenberg, Copromotor: Dr. H.J. Hoogeboom.
- **M.Sc. in Computer Science** Sep. 2000 – Apr. 2004
  Received M.Sc. (Drs.) in Computer Science at LIACS in April 2004.
  Graduated within the Theoretical Computer Science group of Prof. G. Rozenberg. Cum laude, grade point average 9.0.
  M.Sc. thesis title: *Characterizing Reducibility of Gene Patterns in Ciliates*.
  Supervisors: Prof. G. Rozenberg and Dr. H.J. Hoogeboom.
- **University Propaedeuse in Mathematics** Sep. 1999 – Aug. 2000
  Finished first year ("Propedeuse") of Mathematics at Mathematical Institute of Leiden University. Grade point average 8.5.
- **High school** Sep. 1993 – Aug. 1999
  Zandevelt College on VWO level in 's-Gravenzande, The Netherlands.

Professional experience

- **Post-doc in Computer Science** Sep. 2008 – present
  Post-doctoral researcher at LIACS within the the research group lead by Prof. H. Blockeel. Main research topic is graph grammar inference.
- **Teaching Assistant** at LIACS Sep. 2004 – Dec. 2009
  Courses:
  Datastructuren (Datastructures) in each Fall of '04–'08,
  Molecular Computational Biology in each Spring of '05–'08, and
  Fundamentele Informatica 2 (Fundamental Computer Science 2) in Fall of '09.
- **Internship Philips Medical Systems** Jan. 2003 – Jul. 2003
  Performed research on MRI techniques, specifically on Fiber Tracking, at Philips Medical Systems in Best, The Netherlands. This research resulted in a patent, see publication list.

Other

- **Language skills**
  Dutch: native speaker,
  English: fluent.

Publications

Patents

[1] *High angular resolution diffusion weighted MRI.*
Inventors: F.G.C. Hoogenraad, R.F.J. Holthuizen, and R. Brijder.
International patent number WO2005076030,
also EP1714164, and CN1918481 (2005).

Journal papers

[1] F. Bernardini, R. Brijder, M. Cavaliere, G. Franco, and H.J. Hoogeboom G. Rozenberg. On aggregation in multiset-based self-assembly of graphs. To appear in *Natural Computing*, 2010.

[2] F. Bernardini, R. Brijder, G. Rozenberg, and C. Zandron. Multiset-based self-assembly of graphs. *Fundamenta Informaticae*, 75(1-4):49–75, 2007.

[3] R. Brijder, M. Cavaliere, A. Riscos-Núñez, G. Rozenberg, and D. Sburlan. Communication membrane systems with active symports. *Journal of Automata, Languages and Combinatorics*, 11(3):241–261, 2006.

[4] R. Brijder, M. Cavaliere, A. Riscos-Núñez, G. Rozenberg, and D. Sburlan. Membrane systems with proteins embedded in membranes. *Theoretical Computer Science*, 404:26–39, 2008.

[5] R. Brijder and H.J. Hoogeboom. The fibers and range of reduction graphs in ciliates. *Acta Informatica*, 45:383–402, 2008.

[6] R. Brijder and H.J. Hoogeboom. Perfectly quilted rectangular snake tilings. *Theoretical Computer Science*, 410:1486–1494, 2009.

[7] R. Brijder and H.J. Hoogeboom. Combining overlap and containment for gene assembly in ciliates. *Theoretical Computer Science*, 411:897–905, 2010.

[8] R. Brijder and H.J. Hoogeboom. Extended strings and graphs for simple gene assembly. *Theoretical Computer Science*, 411:730–738, 2010.

[9] R. Brijder, H.J. Hoogeboom, and M. Muskulus. Strategies of loop recombination in ciliates. *Discrete Applied Mathematics*, 156:1736–1753, 2008.

[10] R. Brijder, H.J. Hoogeboom, and G. Rozenberg. Reducibility of gene patterns in ciliates using the breakpoint graph. *Theoretical Computer Science*, 356:26–45, 2006.

[11] R. Brijder, H.J. Hoogeboom, and G. Rozenberg. Reduction graphs from overlap graphs for gene assembly in ciliates. *International Journal of Foundations of Computer Science*, 20:271–291, 2009.

[12] M. Muskulus, D. Besozzi, R. Brijder, P. Cazzaniga, S. Houweling, D. Pescini, and G. Rozenberg. Cycles and communicating classes in membrane systems and molecular dynamics. *Theoretical Computer Science*, 372(2-3):242–266, 2007.

[13] M. Muskulus and R. Brijder. Complexity of bio-computation: symbolic dynamics in membrane systems. *International Journal of Foundations of Computer Science*, 17(1):147–165, 2006.

Peer-reviewed conference and workshop papers

[1] H. Blockeel and R. Brijder. Learning non-confluent NLC graph grammar rules. In K. Ambos-Spies, B. Löwe, and W. Merkle, editors, *5th Conference on Computability in Europe (CiE 2009), Mathematical Theory and Computational Practice, Abstract Booklet*, pages 60–69, 2009.

[2] R. Brijder, M. Cavaliere, A. Riscos-Núñez, G. Rozenberg, and D. Sburlan. Membrane systems with external control. In H.J. Hoogeboom, G. Paun, G. Rozenberg, and A. Salomaa, editors, *Workshop on Membrane Computing*, volume 4361 of *Lecture Notes in Computer Science*, pages 215–232. Springer, 2006.

[3] R. Brijder, M. Cavaliere, A. Riscos-Núñez, G. Rozenberg, and D. Sburlan. Membrane systems with marked membranes. *Electronic Notes Theoretical Computer Science*, 171(2):25–36, 2007.

[4] R. Brijder and H.J. Hoogeboom. Applicability of loop recombination in ciliates using the breakpoint graph. In A. Siebes et al., editors, *CompLife '07*, volume 940 of *AIP Conference Proceedings*, pages 50–59, 2007.

[5] R. Brijder and H.J. Hoogeboom. Characterizing reduction graphs for gene assembly in ciliates. In T. Harju, J. Karhumäki, and A. Lepistö, editors, *Developments in Language Theory (DLT) 2007*, volume 4588 of *Lecture Notes in Computer Science*, pages 120–131. Springer, 2007.

[6] R. Brijder and H.J. Hoogeboom. Perfectly quilted rectangular snake tilings. In J. Kari et al., editors, *Proceedings of the Satellite Workshops of DLT 2007, Part 3: Workshop on Tilings and Self-Assembly*, volume 45 of *TUCS General Publication*, 2007.

[7] R. Brijder and H.J. Hoogeboom. Extending the overlap graph for gene assembly in ciliates. In C. Martín-Vide, F. Otto, and H. Fernau, editors, *LATA 2008*, volume 5196 of *Lecture Notes in Computer Science*, pages 137–148. Springer, 2008.

[8] R. Brijder and H.J. Hoogeboom. Pivot and loop complementation on graphs and set systems. In J. Kratochvil and A. Li, editors, *TAMC 2010*, volume 6108 of *Lecture Notes in Computer Science*, pages 151–162. Springer, 2010.

[9] R. Brijder, H.J. Hoogeboom, and M. Muskulus. Applicability of loop recombination in ciliates using the breakpoint graph. In M.R. Berthold et al., editors, *CompLife '06*, volume 4216 of *Lecture Notes in Computer Science*, pages 97–106. Springer, 2006.

[10] R. Brijder, H.J. Hoogeboom, and G. Rozenberg. The breakpoint graph in ciliates. In M.R. Berthold et al., editors, *CompLife '05*, volume 3695 of *Lecture Notes in Computer Science*, pages 128–139. Springer, 2005.

[11] R. Brijder, H.J. Hoogeboom, and G. Rozenberg. From micro to macro: How the overlap graph determines the reduction graph in ciliates. In E. Csuhaj-Varjú and Z. Ésik, editors, *Fundamentals of Computation Theory (FCT) 2007*, volume 4639 of *Lecture Notes in Computer Science*, pages 149–160. Springer, 2007.

[12] R. Brijder, M. Langille, and I. Petre. A string-based model for simple gene assembly. In E. Csuhaj-Varjú and Z. Ésik, editors, *Fundamentals of Computation Theory (FCT) 2007*, volume 4639 of *Lecture Notes in Computer Science*, pages 161–172. Springer, 2007.

[13] M. Muskulus and R. Brijder. First steps towards a geometry of computation. In M.A. Gutiérrez Naranjo et al., editors, *Proceedings of the Third Brainstorming Week on Membrane Computing*, pages 197–218. Fénix Editora, 2005.

[14] M. Muskulus, S. Houweling, G. Rozenberg, D. Besozzi, P. Cazzaniga, D. Pescini, and R. Brijder. Reaction cycles in membrane systems and molecular dynamics. In C. Graciani Diaz et al., editors, *Proceedings of the Fourth Brainstorming Week on Membrane Computing*, volume 2, pages 185–208. Fénix Editora, 2006.

Book chapters

[1] R. Brijder, M. Daley, T. Harju, N. Jonoska, I. Petre, and G. Rozenberg. Computational nature of gene assembly in ciliates. In G. Rozenberg, T.H.W. Bäck, and J.N. Kok, editors, *Handbook of Natural Computing*, Natural Computing Series. Springer, 2010.

[2] R. Brijder and H.J. Hoogeboom. Reality-and-desire in ciliates. In A. Condon, D. Harel, J.N. Kok, A. Salomaa, and E. Winfree, editors, *Algorithmic Bioprocesses*, Natural Computing Series, pages 99–115. Springer, 2009.