

Bibliografía

- [1] A. Alonso-Puig. Application of Waves Displacement Algorithms for the Generation of Gaits in an All terrain Hexapod. In *Climbing and Walking Robots*, pages 343–348, September 2005.
- [2] R. Arredondo. Design and simulation of locomotion of self-organising modular robots for adaptive furniture. Master’s thesis, Swiss Federal Institute of Technology Lausanne, Biologically Inspired Robotics Group, July 2006.
- [3] J. Bares and D. Wettergreen. Dante ii: Technical description, results and lessons learned. *International Journal of Robotics Research*, 18(7):621–649, July 1999.
- [4] Borenstein J., M. Hansen, and H. Nguyen. The OmniTread OT-4 Serpentine Robot for Emergencies and Hazardous Environments. In *Proceeding of the International Joint Topical Meeting: Sharing Solutions for Emergencies and Hazardous Environments*, 12 February 2006.
- [5] Y Bourkin. Self-Organization of Locomotion in Modular Robots. Master’s thesis, University of Sussex, Brighton, United Kingdom, 2004.
- [6] A. Castano, A. Behar, and P. Will. The Conro modules for reconfigurable robots. *IEEE/ASME Trans. Mechatronics*, 7(4):403–409, December 2002.
- [7] A. Castano, R. Chokkalingam, and P. Will. Autonomous and self-sufficient CONRO modules for reconfigurable robots. In *Proc. 5th Int’l Symp. Distributed Autonomous Robotic Systems*, pages 155–164, Knoxville, TN, 2000. Springer-Verlag.
- [8] A. Castano, W. Shen, and P. Will. CONRO: Towards deployable robots with inter-robots metamorphic capabilities. *Autonomous Robots*, 8(3):309–324, June 2000.
- [9] A. Castano and P. Will. Representing and discovering the configuration of CONRO robots. In *Proc. of IEEE Int. Conf. on Robotics and Automation*, pages 3503–3509, 2001.
- [10] L. Chen, Y. Wang, B. Li, S. Ma, and D Duan. Study on Locomotion of a Crawling Robot for Adaptation to the Environment. In Maki K. Habib, editor, *Bioinspiration and Robotics: Walking and Climbing Robots*, chapter 18, pages 301–316. I-Tech Education and Publishing, September 2007.

- [11] L. Chen, Y. Wang, and S. Ma. Studies on lateral rolling locomotion of a snake robot. In *Robotics and Automation, 2004. Proceedings. ICRA '04. 2004 IEEE International Conference on*, volume 5, pages 5070– 5074, April 2004.
- [12] G.S. Chirikjian. Kinematics of a metamorphic robotic system. In *Proceedings of the IEEE Int. Conf. on Robotics and Automation*, volume 1, pages 449–455, May 1994.
- [13] Chirikjian G. S. Metamorphic Hyper-redundant Manipulators. In *Proceedings of the 1993 JSME International Conference on Advanced Mechatronics*, pages 467–472, August 1993.
- [14] G.S Chirkjian and J.W Burdick. Kinematically optimal hyperredundant manipulator configurations. *IEEE transactions on Robotics and Automation*, 11:794–806, 1995.
- [15] H. Choset. Coverage for robotics - a survey of recent results. *Annals of Mathematics and Artificial Intelligence*, 31:113 – 126, 2001.
- [16] H. Choset and W. Henning. A follow-the-leader approach to serpentine robot motion planning. In *ASCE Journal of Aerospace Engineering*, 1999.
- [17] D.J Christensen and K. Stoy. Selecting a Meta-Module to Shape-Change the ATRON Self-Reconfigurable Robot. In *Proceedings of IEEE International Conference on Robotics and Automations*, pages 2532–2538, May 2006.
- [18] A. H. Cohen and P.J Holmes. The Nature of the Couplings Between Segmental Oscillators of the Lamprey Spinal Generator for Locomotion: A Mathematical Model. *Journal of Mathematical Biology*, 13:345–369, 1982.
- [19] J. Conradt and P. Varshavskaya. Distributed central pattern generator control for a serpentine robot. In *Proceedings of the International Conference on Artificial Neural Networks and Neural Information Processing*, 2003.
- [20] A. Crespi, A. Badertscher, and A. Guignard. Swimming and crawling with an amphibious snake robot. In *Proceedings of the 2005 IEEE International Conference on Robotics and Automation*, pages 3035–3039, 2005.
- [21] A. Crespi, A. Badertscher, A. Guignard, and A. J. Ijspeert. An amphibious robot capable of snake and lamprey-like locomotion. In *Proceedings of the 35th international symposium on robotics*, 2004.
- [22] A. Crespi, A. Badertscher, A. Guignard, and A. J. Ijspeert. AmphiBot I : an amphibious snake-like robot. *Robotics and Autonomous Systems*, 50(4):163–175, 2005.
- [23] A. Crespi and A. J. Ijspeert. AmphiBot II: an amphibious snake robot that crawls and swims using a central pattern generator. In *Proceedings of the 9th International Conference on Climbing and Walking Robots*, pages 19–27, 2006.

- [24] A. Degani, A. Shapiro, H. Choset, and M. Mason. A dynamic single actuator vertical climbing robot. In *Intelligent Robots and Systems, 2007. IROS 2007. IEEE/RSJ International Conference on*, pages 2901–2906, November 2007.
- [25] F. Delcomyn. Neural basis of rhythmic behavior in animals. *Science*, 210:492–498, 1980.
- [26] S. Dirk and F. Kirchner. The Bio-Inspired SCORPION Robot: Design, Control and Lessons Learned. In Houxiang Zhang, editor, *Climbing and Walking Robots, Towards New Applications*, pages 197–218, Vienna, Austria, October 2007. I-tech Education and Publishing.
- [27] K. Dowling. *Limbless Locomotion: Learning to Crawl with a Snake Robot*. PhD thesis, Robotics Institute, Carnegie Mellon University, Pittsburgh, PA, December 1997.
- [28] G. Endo and J. Nakanishi. Experimental studies of a neural oscillator for biped locomotion with QRIO. In *Proceedings of the 2005 IEEE International Conference on Robotics and Automation*, pages 596–602, April 2005.
- [29] G. Endo, K. Togawa, and S. Hirose. Study on self-contained and Terrain Adaptive Active Cord Mechanism. In *Proc. of the EEE/RSJ International Conference on Intelligent Robots and System*, pages 1399–1405, 1999.
- [30] G. Figliolini and P. Rea. Mechanics and Simulation of Six-Legged Walking Robots. In Houxiang Zhang, editor, *Climbing and Walking Robots, Towards New Applications*, chapter 1, pages 1–22. I-Tech Education and Publishing, October 2007.
- [31] S. Fukuda, T. Nakagawa. Dynamically reconfigurable robotic system. In *Proc. of the 1988 IEEE Int. Conf. on Robotics and Automation (ICRA)*, pages 1581–1586, April 1988.
- [32] T. Fukuda, S. Nakagawa, and Y. Kawauchi. Self organizing robots based on cell structures—CEBOT. In *Proc. of the IEEE/RSJ int. Conf. Intelligent Robots and Systems (IROS)*, pages 145–150, 1988.
- [33] Y. Fukuoka and H. Kimura. Adaptive dynamic walking of a quadruped robot on irregular terrain based on biological concepts. *The International Journal of Robotics Research*, 22(3-4):187–202, 2003.
- [34] K. Gilpin, K. Kotay, D. Rus, and I. Vasilescu. Miche: Modular shape formation by self-disassembly. *The International Journal of Robotics Research*, 27(3-4):345–372, 2008.
- [35] S. C. Goldstein and T. C. Mowry. Claytronics: A scalable basis for future robots. In *RoboSphere 2004*, Moffett Field, CA, November 2004.
- [36] M.P. Golombek and et al. Selection of the Mars Exploration Rover landing sites. *Journal of Geophysical Research*, 108(E3):ROV13.1–ROV13.48, October 2003.
- [37] A. Golovinsky, M. Yim, Z. Ying, and C. Eldershaw. PolyBot and PolyKinetic System: a modular robotic platform for education. In *Proceedings of the IEEE International Conference on Robotics and Automation*, volume 2, pages 1381–1386, 2004.

- [38] J. González-Gómez. Diseño de Robots Ápodos. Master's thesis, Escuela Politécnica Superiore. Universidad Autónoma de Madrid, July 2003. Disponible en línea en <http://www.ierobotics.com/personal/juan/doctorado/tea/tea.html> [Última consulta 14-Mayo-2008].
- [39] J. Gonzalez-Gomez, Aguayo E., and E. Boemo. Locomotion of a Modular Worm-like Robot Using a FPGA-based Embedded MicroBlaze Soft-processor. In M. Armada and P. Gonzalez, editor, *Climbing and Walking Robots. Proceedings of the 7th International Conference CLAWAR 2004*, number ISBN 978-3-540-22992-6, pages 869–878. Springer Berlin Heidelberg, 2004.
- [40] J. Gonzalez-Gomez and E. Boemo. Motion of Minimal Configurations of a Modular Robot: Sinusoidal, Lateral Rolling and Lateral shift. In *Proc. of the Int. Conf. on Climbing and Walking Robots*, pages 667–674, September 2005.
- [41] J. Gonzalez-Gomez, I. Gonzalez, F. Gomez-Arribas, and E. Boemo. Evaluation of a Locomotion Algorithm for Worm-Like Robots on FPGA-Embedded Processors. In *Lecture Notes in Computer Science*, volume 3985, pages 24–29. Springer Berlin / Heidelberg, March 2006.
- [42] J. Gonzalez-Gomez, H. Zhang, E. Boemo, and J. Zhang. Locomotion capabilities of a Modular Robot with Eight Pitch-Yaw-Connecting Modules. In *Proc. of the Int. Conf. on Climbing and Walking machines*, pages 150–157, September 2006.
- [43] G. Granosik, M. G. Hansen, and J. Borenstein. The Omnitread Serpentine Robot for Industrial Inspection and Surveillance. *Industrial Robot*, 32(2):139–148, 2005.
- [44] R. Groß, M. Bonani, F. Mondada, and M. Dorigo. Autonomous self-assembly in a swarm-bot. In K. Murase, K. Sekiyama, N. Kubota, T. Naniwa, and J. Sitte, editors, *Proc. of the 3rd Int. Symp. on Autonomous Minirobots for Research and Edutainment (AMiRE 2005)*, pages 314–322. Springer, Berlin, Germany, 2006.
- [45] B. Haller. Neubot Project: Framework for the Simulations of Modular Robots and Self-Organisation of Locomotion under Water. Master's thesis, School of Computer and Communication Science. Swiss Federal Institute of Technology Lausanne, 18 February 2005.
- [46] G.J. Hamlin and A.C. Sanderson. TETROBOT modular robotics: prototype and experiments. In *Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems*, volume 2, pages 390 – 395, November 1996.
- [47] F. Herrero Carrón. Study and application of central pattern generators to the control of a modular robot. Master's thesis, Escuela Politécnica Superior, Universidad Autónoma de Madrid, 30 August 2007.
- [48] S. Hirose. *Biologically Inspired Robots (Snake-like Locomotor and Manipulator)*. Oxford Science Press, 1993.

- [49] S. Hirose and G. Endo. Development of Autonomous Snake-Like Robot ACM R-1. In *Proc. Annual Conf. Robotics and Mechatronics*, page 1997, 1997. (in Japanese).
- [50] S. Hirose and E.F. Fukushima. Snakes and Strings: New Robotic Components for Rescue Operations. *The International Journal of Robotics Research*, 23(4-5):341–349, 2004.
- [51] S. Hirose, Imazato M., Kudo Y., and Umetani Y. Internally-balanced magnet unit. *Advanced robotics*, 1(3):225–242, 1986.
- [52] S. Hirose and A. Morishima. Articulated Body Mobile Robot. In *Proc. 7th RoManSy Symp*, pages 1–8, 1988.
- [53] S. Hirose and A. Morishima. Design and control of a mobile robot with an articulated body. *The International Journal of Robotics Research*, 9(2):99–113, 1990.
- [54] S. Hirose, A. Morishima, and S. Tukagosi. Design of Practical Snake Vehicle: Articulated Body Mobile Robot KR-II. In *Proc. 5th Int. Conf. Advanced Robotics*, volume 1, pages 833–838, 1991.
- [55] K. Hosokawa, T. Tsujimori, and T. Fujii. Self-organizing collective robots with morphogenesis in a verticalplane. In *Proc. of the IEEE Int. Conf. on Robotics and Automation*, volume 4, pages 2858–2863, 1998.
- [56] A. J Ijspeert. *Design of artificial neural oscillatory circuits for the control of lamprey- and salamander-like locomotion using evolutionary algorithms*. PhD thesis, University of Edinburgh, 1998.
- [57] A.J. Ijspeert and J.M. Cabelguen. Gait transition from swimming to walking: investigation of salamander locomotion control using non-linear oscillators. In *Adaptive Motion of Animals and Machines*, pages 177–188. Springer Tokyo, July 2006.
- [58] A.J. Ijspeert and A. Crespi. Simulation and robotics studies of salamander locomotion. Applying neurobiological principles to the control of locomotion in robots. *Neuroinformatics*, 3(3):171–196, 2005.
- [59] A.J. Ijspeert and A. Crespi. Online trajectory generation in an amphibious snake robot using a lamprey-like central pattern generator model. In *Proceedings of the 2007 IEEE International Conference on Robotics and Automation*, pages 262–268, 2007.
- [60] A.J. Ijspeert and J. Kodjabachian. Evolution and development of a central pattern generator for the swimming of a lamprey. *Artificial Life*, 5(3):247–269, 1999.
- [61] M.W. Jorgensen, E.H. Ostergaard, and H.H. Lund. Modular ATRON: modules for a self-reconfigurable robot. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, volume 2, pages 2068– 2073, 2004.

- [62] T. Kamegawa, T. Yamasaki, H. Igarashi, and F. Matsuno. Development of the snake-like rescue robot. In *Proc. of the IEEE Int. Conf. on Robotics and Automation*, volume 5, pages 5081–5086, April 2004.
- [63] A. Kamimura, H. Kurokawa, E. Toshida, K. Tomita, S. Murata, and S. Kokaji. Automatic locomotion pattern generation for modular robots. In *Proceedings of the IEEE International Conference on Robotics and Automation*, volume 1, pages 714–720, September 2003.
- [64] A. Kamimura, H. Kurokawa, and E. Yoshida. Automatic locomotion design and experiments for a modular robotic system. *IEEE/ASME Transactions on Mechatronics*, 10(3):314–325, June 2005.
- [65] A. Kamimura, H. Kurokawa, and T. Yoshida. Distributed adaptive locomotion by a modular robotic system, M-TRAN II. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems, 2004. (IROS 2004).*, volume 3, pages 2370–2377, September 2004.
- [66] A. Kamimura, S. Murata, and E. Yoshida. Self-reconfigurable modular robot. Experiments on reconfiguration and locomotion. In *Proceedings of 2001 IEEE/RSJ International Conference on Intelligent Robots and Systems*, pages 606–612, 2001.
- [67] A. Kamimura, S. Murata, E. Yoshida, H. Kurokawa, K. Tomita, and S. Kokaji. Self-reconfigurable modular robot - experiments on reconfigurationand locomotion. In *Proceedings of the IEEE/RSJ International Conference on intelligent Robots and Systems*, volume 1, pages 606–612, 2001.
- [68] A. Kawakami, A. Torii, and K. Motomura. Development of Uni-Rover with the Function of Wheeled Locomotion and Manipulation. *Proc. TITech COE/Super Mechano-Systems Symposium*, 2001.
- [69] H. Kimura and S. Hirose. Development of Genbu : Active wheel passive joint articulated mobile robot. In *Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and System*, volume 1, pages 823–828, 2002.
- [70] B. Kirby, J. D. Campbell, B. Aksak, P. Pillai, J. F. Hoburg, T. C. Mowry, and S. Goldstein. Catoms: Moving robots without moving parts. In *AAAI (Robot Exhibition)*, pages 1730–1, Pittsburgh, PA, July 2005.
- [71] B. Klaassen and K.L. Paap. GMD-SNAKE2: a snake-like robot driven by wheels and a method for motion control. In *Proceedings of IEEE International Conference on Robotics and Automation*, pages 3014–3019, 1999.
- [72] K. Kotay. *Self-Reconfiguring Robots: Designs, Algorithms, and Applications*. PhD thesis, Dartmouth College, Computer Science Department, 2003.
- [73] K. Kotay and D. Rus. Efficient Locomotion for a Self-Reconfiguring Robot. In *Proc. of the IEEE Int. Conf. on Robotics and Automation*, pages 2963–2969, 2005.

- [74] K. Kotay, D. Rus, and M. Vona. The Self-reconfiguring Robotic Molecule. In *Proc. of the IEEE Int. Conf. on Robotics and Automation*, pages 424–431, 1998.
- [75] E. Krotkov, R. Simmons, and W. Whittaker. Ambler: Performance of a six-legged planetary rover. *Acta Astronautica*, 35(1):75–81, 1995.
- [76] H. Kurokawa, A. Kamimura, and T. Yoshida. M-TRAN II: metamorphosis from a four-legged walker to a caterpillar. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, volume 3, pages 2454–2459, September 2003.
- [77] H. Kurokawa, K. Tomita, and A. Kamimura. Distributed Metamorphosis Control of a Modular Robotic System M-TRAN. In *Distributed Autonomous Robotic Systems 7*, pages 115–124. Springer Japan, 2006.
- [78] H. Kurokawa, K. Tomita, and T. Yoshida. Motion simulation of a modular robotic system. In *IProceedings of the 26th Annual Conference of the IEEE Industrial Electronics Society*, volume 4, pages 2473–2478, 2000.
- [79] H. Kurokawaa, E. Yoshidaa, and K. Tomita. Self-reconfigurable M-TRAN structures and walker generation. *Robotics and Autonomous Systems*, 54(2):142–149, February 2006.
- [80] S. J. Lawrence, G. J. Taylor, R. C. F. Lentz, L. M. Martel, W. Shen, M. Will, M. H. Sims, S. Colombano, D. Kortenkamp, B. Damer, and W. Chun. SuperBots on the lunar surface: A habitat operations and maintenance system (HOMS). In *Lunar Exploration Analysis Group (LEAG)*, 2005.
- [81] C. Leger. *Darwin 2k: An Evolutionary Approach to Automated Design for Robotics*. Kluwer Academic Publishers, Norwell, MA, USA, 2000.
- [82] R. C. F. Lentz, G. J. Taylor, S. J. Lawrence, L. M. Martel, Wei-Min Shen, Peter M. Will, M. H. Sims, S. Colombano, D. Kortenkamp, B. Damer, and W. Chun. SuperBots on the lunar surface: A robotic multi-use lunar explorer (MULE). In *Lunar Exploration Analysis Group (LEAG)*, 2005.
- [83] R.A. Lindemann and C.J. Voorhees. Mars Exploration Rover mobility assembly design, test and performance. In *IEEE International Conference on Systems, Man and Cybernetics*, volume 1, pages 450–455, October 2005.
- [84] K. Lipkin, I. Brown, A. Peck, H. Choset, J. Rembisz, P. Gianfortoni, and A. Naaktgeboren. Differentiable and piecewise differentiable gaits for snake robots. In *Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems*, pages 1864–1869, October 2007.
- [85] S. Ma, H. Araya, and L. Li. Development of a creeping snake-robot. In *Proceedings of the IEEE International Symposium on Computational Intelligence in Robotics and Automation*, pages 77–82, 2001.

- [86] S. Ma, W.J. Li, and Y. Wang. A simulator to analyze creeping locomotion of a snake-like robot. In *Proceedings of IEEE International Conference on Robotics and Automation*, volume 4, pages 3656– 3661, 2001.
- [87] S. Ma and Y. Ohmameuda. Control of a 3-dimensional snake-like robot. In *Proceedings of the IEEE International Conference on Robotics and Automation*, volume 2, pages 2067– 2072, September 2003.
- [88] S. Ma and N. Tadokoro. Analysis of Creeping Locomotion of a Snake-like Robot on a Slope. *Autonomous Robots*, 20(1):15–23, January 2006.
- [89] D. Marbach. Evolution and Online Optimization of Central Pattern Generators for Modular Robot Locomotion. Master’s thesis, School of Computer and Communication Sciences, Swiss Federal Institute of Technology Lausanne., 7 January 2005.
- [90] D. Marbach and A.J. Ijspeert. Online Optimization of Modular Robot Locomotion. In *In Proceedings of the IEEE International Conference on Mechatronics & Automation*, pages 248– 253, June 2005.
- [91] K. Matsuoka. Mechanisms of frequency and pattern control in the neural rhythm generators. *Biological Cybernetics*, 56(5-6):345–353, 1987.
- [92] Jerome Maye. Control of Locomotion in Modular Robotics. Master’s thesis, School of Computer and Communication Science. Swiss Federal Institute of Technology Lausanne, 23 February 2007.
- [93] P.G Miller. Snake Robots for Search and Rescue. In *Neurotechnology for Biomimetic Robots*, pages 271–284. MIT Press, 2002.
- [94] R. Moeckel, C. Jaquier, K. Drapel, E. Dittrich, A. Upégui, and A.J. Ijspeert. Exploring adaptive locomotion with YaMoR, a novel autonomous modular robot with Bluetooth interface. *Industrial Robot*, 33(4):285–290, 2006.
- [95] R. Moeckel, C. Jaquier, K. Drapel, A. Upégui, and A. Ijspeert. YaMoR and bluemove – an autonomous modular robot with bluetooth interface for exploring adaptive locomotion. In *Proceedings CLAWAR 2005*, pages 685–692, 2005.
- [96] F. Mondada, G. C. Pettinaro, A. Guignard, I. Kwee, D. Floreano, J.-L. Deneubourg, S. Nolfi, L.M. Gambardella, and M. Dorigo. Swarm-bot: a new distributed robotic concept. *Autonomous Robots*, 17(2–3):193–221, 2004.
- [97] F. Mondada, G. C. Pettinaro, I. Kwee, A. Guignard, L. Gambardella, D. Floreano, S. Nolfi, J.-L. Deneubourg, and M. Dorigo. SWARM-BOT: A swarm of autonomous mobile robots with self-assembling capabilities. In C.K. Hemelrijk and E. Bonabeau, editors, *Proceedings of the International Workshop on Self-organisation and Evolution of Social Behaviour*, pages 307–312, Monte Verità, Ascona, Switzerland, September 8-13, 2002. University of Zurich.

- [98] M. Mori and S. Hirose. Development of Active Cord Mechanism ACM-R3 with Agile 3D mobility. In *Proc. of the EEE/RSJ International Conference on Intelligent Robots and System*, pages 1552–1557, 2001.
- [99] M. Mori and S. Hirose. Three-dimensional serpentine motion and lateral rolling by Active Cord Mechanism ACM-R3. In *Proc. of IEEE/RSJ Int. Conf. on intelligent Robots and Systems*, pages 829–834, 2002.
- [100] J.M. Morrey, B. Lambrecht, A.D. Horchler, R.E. Ritzmann, and R.D. Quinn. Highly mobile and robust small quadruped robots. In *Proceedings. 2003 IEEE/RSJ International Conference on Intelligent Robots and Systems, 2003. (IROS 2003).*, volume 1, pages 82–87, October 2003.
- [101] S. Murata and H. Kurokawa. Self-Reconfigurable Robot. *IEEE Robotics and Automation Magazine*, 14(1):71–78, March 2007.
- [102] S. Murata, H. Kurokawa, and S. Kokaji. Self-assembling machine. In *Proc. of Int. Conf. on Robotics and Automation*, volume 1, pages 441–448, 1994.
- [103] S. Murata, H. Kurokawa, E. Yoshida, K. Tomita, and S. Kokaji. A 3-D self-reconfigurable structure. In *Proc. of the IEEE Int. Conf. on Robotics and Automation*, volume 1, pages 432–439, May 1998.
- [104] S. Murata, E. Yoshida, A. Kamimura, H. Kurokawa, K. Tomita, and S. Kokaji. M-TRAN: self-reconfigurable modular robotic system. *IEEE/ASME Transactions on Mechatronics*, 7(4):431–441, December 2002.
- [105] S. Murata, E. Yoshida, and H. Kurokawa. Self-Repairing Mechanical Systems. *Autonomous Robots*, 10(1):7–21, January 2001.
- [106] S. Murata, E. Yoshida, K. Tomita, H. Kurokawa, A. Kamimura, and S. Kokaji. Hardware design of modular robotic system. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, volume 3, pages 2210–2217, November 2000.
- [107] Paap K.L., T. Christaller, and F. Kirchner. A robot snake to inspect broken buildings. In *Proceeding of the 2000 IEEE/ RSJ International Conference on Intelligent Robots and Systems*, pages 2079–2082, 2000.
- [108] A. Pamecha, C. Chiang, D. Stein, and G. Chirikjian. Design and implementation of metamorphic robots. In *Proceedings of the 1996 ASME Design Engineering Technical Conference and Computers in Engineering Conference*, August 1996.
- [109] M. Park, S. Chitta, A. Teichman, and M. Yim. Automatic Configuration Recognition Methods in Modular Robots. *The International Journal of Robotics Research*, 27(3-4):403–421, 2008.
- [110] A. Prieto-Moreno. Diseño, construcción y control de un robot articulado mediante una red de microcontroladores. Proyecto fin de carrera, February 2001.

- [111] A. Prieto-Moreno. Estudio de la locomoción de un robot cuadrúpedo mediante la generación de patrones biológicos. Master's thesis, Escuela Politécnica superior. Universidad Autónoma de Madrid, October 2007.
- [112] R.D. Quinn, J.T. Offi, D.A. Kingsley, and R.E. Ritzmann. Improved mobility through abstracted biological principles. In *IEEE/RSJ International Conference on Intelligent Robots and System, 2002.*, volume 3, pages 2652–2657, 2002.
- [113] E. Rome, J. Hertzberg, F. Kirchner, U. Licht, and T. Christaller. Towards autonomous sewer robots: the MAKRO project. *Urban Water*, 1(1):57–70, 1999.
- [114] K. Roufas, Y. Zhang, D. Duff, and M. Yim. Six Degree of Freedom Sensing For Docking Using IR LED Emitters. In *Experimental Robotics VII*, volume 271, pages 91–100. Springer Berlin / Heidelberg, 2001.
- [115] C. M Rovainen. Neurobiology of lampreys. *Physiological Reviews*, 59(4):1007–1077, 1 October 1979.
- [116] Michael Rubenstein, Kenneth Payne, Peter Will, and Wei-Min Shen. Docking among independent and autonomous CONRO self-reconfigurable robots. In *Proc. of the IEEE Int. conf. on Robotics and Automation*, pages 2877–2882, New Orleans, USA, April/May 2004.
- [117] N. F Rulkov. Modeling of spiking-bursting neural behavior using two-dimensional map. *Physical Review E*, 65(4):041922, April 2002.
- [118] D. Rus and M. Vona. Self-reconfiguration planning with compressible unit modules. In *Proceedings of the IEEE Intl. Conference on Robotics and Automation*, volume 4, pages 2513–2520, Detroit, MI, USA, 1999.
- [119] D. Rus and M. Vona. Crystalline robots: Self-reconfiguration with compressible unit modules. *Autonomous Robots*, 10(1):107–124, 2001.
- [120] B. Salemi, M. Moll, and W. Shen. SUPERBOT: A deployable, multi-functional, and modular self-reconfigurable robotic system. In *Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems*, Beijing, China, October 2006. To appear.
- [121] B. Salemi, W. Shen, and P. Will. Hormone-controlled metamorphic robots. In *Proc. of the Int. Conf. on Robotics and Automation*, volume 4, pages 4194–419, 2001.
- [122] B. Salemi, P. Will, and W. Shen. Autonomous discovery and functional response to topology change in self-reconfigurable robots. In Dan Braha, Ali A. Minai, and Yaneer Bar-Yam, editors, *Complex Engineering Systems: Science Meets Technology*, pages 364–384. Springer, 2006.
- [123] J. Sastra, S. Chitta, and M. Yim. Dynamic Rolling for a Modular Loop Robot. In *Experimental Robotics*, volume 39 of *Springer Tracts in Advanced Robotics*, pages 421–430. Springer Berlin / Heidelberg, 2008.

- [124] J. Sastra, W. Giovanni, B Heredia, and J. Clark. A biologically-inspired dynamic legged locomotion with a modular reconfigurable robot. In *Proceedings of ASME Dynamic Systems and Control Conference*, October 2008.
- [125] Satoshi Murata Kiyoharu Kakomura Haruhisa Kurokawa. Docking Experiments of a Modular Robot by Visual Feedback. In *Proceeding of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, pages 625–630, October 2006.
- [126] Elie A Shammas, Alon Wolf, and Howie Choset. Three degrees-of-freedom joint for spatial hyper-redundant robots. *Journal of Mechanism and Machine Theory*, pages 170 – 190, April 2005.
- [127] Wei-Min Shen, J. Bogdanowicz, W. Chun, M. Yim, Peter M. Will, M. Sims, S. Colombano, D. Kortenkamp, S. Vanderzyl, E. Baumgartner, and J. Taylor. SuperBots: Modular, multifunctional, reconfigurable robotic system for space exploration. In *Lunar Exploration Analysis Group (LEAG)*, 2005.
- [128] Wei-Min Shen, Maks Krivokon, Harris Chiu, Jacob Everist, Michael Rubenstein, and Jagadesh Venkatesh. Multimode locomotion for reconfigurable robots. *Autonomous Robots*, 20(2):165–177, 2006.
- [129] Wei-Min Shen, Behnam Salemi, and Peter Will. Hormone-inspired adaptive communication and distributed control for CONRO self-reconfigurable robots. *Trans. on Robotics and Automation*, 18(5):700–712, October 2002.
- [130] M. L. Shik and Severin. Control of walking and running by means of electrical stimulation of the mid-brain. *Biophysics*, 11:756–765, 1966.
- [131] B. Shirmohammadi, M. Yim, and J. Sastra. Using Smart Cameras to Localize Self-Assembling Modular Robots. In *DFirst ACM/IEEE International Conference on istributed Smart Cameras*, pages 76–80, September 2007.
- [132] K.A . Sigvardt and T.L. Williams. Effects of local oscillator frequency on intersegmental coordination in the Lamprey locomotor Cpg: theory and experiments. *Journal of Neurophysiology*, 76(6):4094–4103, December 1996.
- [133] D. Spenneberg, M. Albrecht, T. Backhaus, J. Hilljegerdes, F. Kirchner, and H. Zschunker. ARAMIES: A Four-legged Climbing and Walking Robot. In *'i-SAIRAS 2005' - The 8th International Symposium on Artificial Intelligence, Robotics and Automation in Space*, volume 603 of *ESA Special Publication*, August 2005.
- [134] D. Spenneberg, F. Kirchner, and J. de Gea. Ambulating robots for exploration in rough terrain on future extraterrestrial missions, 2004.
- [135] B. Spranklin. *Design, Analysis, and Fabrication of a Snake-Inspired Robot with a Rectilinear Gait*. PhD thesis, University of Maryland, June 2006.

- [136] A. Sproewitz, R. Moeckel, J. Maye, M. Asadpour, and A.J. Ijspeert. Adaptive locomotion control in modular robotics. In *Workshop on Self-Reconfigurable Robots/Systems and Applications IROS07*, pages 81–84, November 2007.
- [137] Alexander Sproewitz, Rico Moeckel, Jérôme Maye, and Auke Jan Ijspeert. Learning to move in modular robots using central pattern generators and online optimization. *Int. J. Rob. Res.*, 27(3-4):423–443, 2008.
- [138] H. Streich and O. Adria. Software approach for the autonomous inspection robot MAKRO. In *Proc. of the IEEE Int. Conf. on Robotics and Automation*, volume 4, pages 3411– 3416, 2004.
- [139] Y. Sugiyama, A. Shiotsu, and M. Yamanaka. Circular/spherical robots for crawling and jumping. In *Proc. of the IEEE Int. Conf. on Robotics and Automation*, pages 3595– 3600, 2005.
- [140] J.W. Suh, S.B. Homans, and M. Yim. Telecubes: mechanical design of a module for self-reconfigurable robotics. In *Proceedings of the IEEE Int. Conf. on Robotics and Automation*, volume 4, pages 4095– 4101, 2002.
- [141] T. Takayama and S. Hirose. Development of Souryu-I connected crawler vehicle for inspection of narrow and winding space. In *Proceeding of the 26th Annual Conference of the IEEE Industrial Electronics Society*, volume 1, pages 143–148, 2000.
- [142] T. Takayama and S. Hirose. Amphibious 3D Active Cord Mechanism "HELIX"with Helical Swimming Motion. In *Proc. of IEEE/RSJ Int. Conf. on intelligent Robots and Systems*, volume 1, pages 775– 780, 2002.
- [143] T. Takayama and S. Hirose. Development of "Souryu I and IIConnected Crawler Vehicle for Inspection of Narrow and Winding Space. *Robotics and Mechatronics*, 15(1):61–69, 2003.
- [144] I. Tanev, T. Ray, and A. Buller. Automated Evolutionary Design, Robustness, and Adaptation of Sidewinding Locomotion of a Simulated Snake-Like Robot. *IEEE Transactions on Robotics and Automation*, 21(4):632–645, 2005.
- [145] G. J. Taylor, R. C. F. Lentz, S. J. Lawrence, L. M. Martel, Wei-Min Shen, Peter M. Will, M. H. Sims, S. Colombano, D. Kortenkamp, B. Damer, and W. Chun. SuperBots on the lunar surface: Mini-mobile investigation system (Mini-MIS). In *Lunar Exploration Analysis Group (LEAG)*, 2005.
- [146] K. Togawa, M. Mori, and S. Hirose. Study on Three-dimensional Active Cord Mechanism: Development of ACM-R2. In *Proc. of the EEE/RSJ International Conference on Intelligent Robots and System*, pages 2242–2247, 2000.
- [147] Y. Umetani and S. Hirose. Biomechanical Study of Serpentine Locomotion. In *Proc. of the 1st RoManSySymp*, pages 171–184, 1974.
- [148] C. Unsal. I-Cubes, A Modular Self-Reconfigurable Bipartite System. *Robotics and Machine Perception*, 9(1), March 2000.

- [149] J. Ute and K. Ono. Fast and efficient locomotion of a snake robot based on self-excitation principle. In *Proc. 7th International Workshop on Advanced Motion Control*, pages 532– 539, 2002.
- [150] W. Wang and G. Zong. Analysis on The Mechanics Stability for a New Kind of Robot. *Journal of Robot*, 21(7):642–648, 99.
- [151] T.L. Williams and K.A. Sigvardt. Intersegmental phase lags in the lamprey spinal cord: experimental confirmation of the existence of a boundary region. *Journal of Computational Neuroscience*, 1:61–67, 1994.
- [152] T.L. Williams and K.A. Sigvardt. Spinal cord of Lamprey: generation of locomotor patterns. In *The handbook of brain theory and neural networks*, pages 918–921. MIT Press, 1995.
- [153] D. M. Wilson. The central nervous control of flight in a locust. *Journal of Experimental Biology*, 38:471–490, 1961.
- [154] Alon Wolf, H. Benjamin Brown, Randy Casciola, Albert Costa, Michael Schwerin, E. Shamas, and Howie Choset. A mobile hyper redundant mechanism for search and rescue tasks. In *Proceedings of the 2003 IEEE/RSJ International Conference on Intelligent Robots and Systems*, volume 3, pages 2889 – 2895, October 2003.
- [155] C. Wright, A. Johnson, A. Peck, Z. McCord, A. Naaktgeboren, P. Gianfortoni, M. Gonzalez-Rivero, R. Hatton, and H. Choset. Design of a modular snake robot. In *Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems*, pages 2609–2614, October 2007.
- [156] H. Yamada, S. Chigasaki, and M. Mori. Development of Amphibious Snake-like Robot ACM-R5. In *The Proc. of 36th Int. Symposium on Robotics*, 2005.
- [157] H. Yamada and S. Hirose. Development of Practical 3-Dimensional Active Cord Mechanism ACM-R4. *Journal of Robotics and Mechatronics*, 18(3), 2006.
- [158] M. Yamakita, M. Hashimoto, and T. Yamada. Control of locomotion and Head Configuration of a 3D Snake Robot. In *ICRA '03. Proc of the IEEE Int. Conf. on Robotics and Automation*, volume 2, pages 2055– 2060, September 2003.
- [159] M. Yerly. YaMoR Lifelong Learning. Master's thesis, Computer Science Department, University of Fribourg, 2007.
- [160] M. Yim. *Locomotion with a unit-modular reconfigurable robot*. PhD thesis, Stanfodf University, December 1995. Disponible on-line en <http://www-db.stanford.edu/TR/CS-TR-95-1536.html> [Última consulta 10-Mayo-2008].
- [161] M. Yim, D. Duff, and K. Roufas. Modular Reconfigurable Robots, An Aproach to Urban Search and Rescue. In *Proc. of 1st Intl. Workshop on Human-friendly welfare Robotic Systems*, pages 69–76, January 2000.

- [162] M. Yim, D.G. Duff, and K. D. Roufas. PolyBot: a modular reconfigurable robot. In *Proceedings of the IEEE International Conference on Robotics and Automation*, volume 1, pages 514–520, April 2000. Disponible en línea en <http://www2.parc.com/spl/projects/modrobots/publications/pdf/icra00.pdf> [Última consulta: 14-Mayo-2008].
- [163] M. Yim, C. Eldershaw, Y. Zhang, and D. Duff. Limbless Conforming Gaits with Modular Robots. In *Experimental Robotics IX*, volume 21 of *Walking Robots*, page 21. Springer Berlin / Heidelberg, 2006.
- [164] M. Yim, R. Hinden, C. Conley, C.K. Wang, K. Roufas, and C. Eldershaw. Open Loop Climbing with Modular Robots. In *Video Proceeding of the IEEE Internationa Conference on Robotics and Automation*, 2006.
- [165] M. Yim, S. Homans, and K. Roufas. Climbing with Snake-like Robots. In *Proc. of the IFAC Workshop on Mobile Robot Technology*, 21 May 2001.
- [166] M. Yim, K. Roufas, and D. Duff. Modular Reconfigurable Robots in Space Applications. *Autonomous Robots*, 14(2-3):225–237, March 2003.
- [167] M. Yim, W. M. Shen, and B. Salemi. Modular self-reconfigurable robot systems. *IEEE Robotics and automation Magazine*, 14(1):43–52, 2007.
- [168] M. Yim, B. Shirmohammadi, and D. Benelli. Amphibious modular robotic astrobiology. In *Proceedings of SPIE*, volume 6561 of *Unmanned Systems Technology IX*, page 65611S, May 2007.
- [169] M. Yim, B. Shirmohammadi, and J. Sastra. Robustness and self-repair in modular robots. In *IEEE/RSJ International Conference on Intelligent Robots and Systems*, pages 2553–2554, October 2007.
- [170] M. Yim, B. Shirmohammadi, and J. Sastra. Towards robotic self-reassembly after explosion. In *IEEE/RSJ International Conference on Intelligent Robots and Systems*, pages 2767–2772, October 2007.
- [171] M. Yim, Y. Zhang, and D. Duff. Modular robots. *IEEE Spectrum*, 39(2):30–34, February 2002.
- [172] M. Yim, Y. Zhang, K. Roufas, D. Duff, and C. Eldershaw. Connecting and disconnecting for chain self-reconfiguration with PolyBot. *IEEE/ASME Transactions on Mechatronics*, 7(4):442–451, December 2002.
- [173] M. H. Yim, D. Goldberg, and A. Casal. Connectivity planning for closed-chain reconfiguration. In G. T. McKee and P. S. Schenker, editors, *Proc. SPIE Vol. 4196, p. 402-412, Sensor Fusion and Decentralized Control in Robotic Systems III*, Gerard T. McKee; Paul S. Schenker; Eds., volume 4196 of *Presented at the Society of Photo-Optical Instrumentation Engineers (SPIE) Conference*, pages 402–412, October 2000.

- [174] Yim M., D.G. Duff, and Roufas K.D. Walk on the wild side. *IEEE robotics and automation magazine*, 9(4):49–53, 2002.
- [175] E. Yoshida, A. Kamimura, and K. Tomita. A Self-Reconfigurable Modular Robot: Reconfiguration Planning and Experiments. *The International Journal of Robotics Research*, 21(10–11):903–915, 2002.
- [176] E. Yoshida, S. Murata, A. Kamimura, K. Tomita, H. Kurokawa, and S. Kokaji. A motion planning method for a self-reconfigurable modular robot. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, volume 1, pages 590–597, 2001.
- [177] H. Zhang, Z. Deng, and W. Wang. Novel Reconfigurable Robot with 3 DOF Active Joints for Rugged Terrain. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, pages 5588 – 5593, October 2006.
- [178] H. Zhang, W. Wang, and Z. Deng. A Novel Reconfigurable Robot for Urban Search and Rescue. *International Journal of Advanced Robotic Systems*, 3(4):359–366, 2006.
- [179] Y. Zhang, K.D. Roufas, and M. Yim. Software architecture for modular self-reconfigurable robots. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, volume 4, pages 2355–2360, 2001.
- [180] Y. Zhang, M. Yim, C. Eldershaw, D. Duff, and K. Roufas. Phase automata: a programming model of locomotion gaits for scalable chain-type modular robots. In *IProceedings. of the IEEE/RSJ International Conference on intelligent Robots and Systems*, volume 3, pages 2442–2447, 2003.
- [181] G. Zong, Z. Deng, and W. Wang. Realization of a Modular Reconfigurable Robot for Rough Terrain. In *Proceedings of the 2006 IEEE International Conference on Mechatronics and Automation*, pages 289–294, 2006.
- [182] V. Zykov, A. Chan, and H. Lipson. Molecubes: An Open-Source Modular Robotics Kit. In *Proc. of the IEEE Int. Conf. on Intelligent Robots and systems*, 2007.
- [183] V. Zykov, E. Mytilinaios, B. Adams, and H. Lipson. Self-reproducing machines. *Nature*, 435(7039):163–164, 2005.