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## Publications

### **A Compliant Leg Structure for Terrestrial and Aquatic Walking Robots**

Billeschou, P., Do, C. D., Larsen, J. C. & Manoonpong, P., 2022, *Robotics for Sustainable Future, CLAWAR 2021*. Chugo, D., Tokhi, M. O., Silva, M. F., Nakamura, T. & Goher, K. (eds.). Springer, p. 69-80 12 p. (Lecture Notes in Networks and Systems, Vol. 324 LNNS).

### **Insect-inspired robots: Bridging biological and artificial systems**

Manoonpong, P., Patanè, L., Xiong, X., Brodoline, I., Dupeyroux, J., Viollet, S., Arena, P. & Serres, J. R., Nov 2021, In: *Sensors*. 21, 22, 43 p., 7609.

### **Online sensorimotor learning and adaptation for inverse dynamics control**

Xiong, X. & Manoonpong, P., Nov 2021, In: *Neural Networks*. 143, p. 525-536

### **Continuous Online Adaptation of Bioinspired Adaptive Neuroendocrine Control for Autonomous Walking Robots**

Homchanthanakul, J. & Manoonpong, P., 20. Oct 2021, (E-pub ahead of print) In: *IEEE Transactions on Neural Networks and Learning Systems*. 13 p.

### **The SMOOTH-Robot: A Modular, Interactive Service Robot**

Krüger, N., Fischer, K., Manoonpong, P., Palinko, O., Bodenhausen, L., Baumann, T., Kjærum, J., Rano, I., Naik, L., Juel, W. K., Haarslev, F., Ignasov, J., Marchetti, E., Langedijk, R. M., Kollakidou, A., Camillus Jeppesen, K., Heidtmann, C. & Dalgaard, L., 5. Oct 2021, In: *Frontiers in Robotics and AI*. 8, 22 p., 645639.

### **Distributed-force-feedback-based reflex with online learning for adaptive quadruped motor control**

Sun, T., Dai, Z. & Manoonpong, P., Oct 2021, In: *Neural Networks*. 142, p. 410-427

### **Lateral undulation of the bendable body of a gecko-inspired robot for energy-efficient inclined surface climbing**

Haomachai, W., Shao, D., Wang, W., Ji, A., Dai, Z. & Manoonpong, P., Oct 2021, In: *IEEE Robotics and Automation Letters*. 6, 4, p. 7917-7924

### **Mini Review: Comparison of Bio-Inspired Adhesive Feet of Climbing Robots on Smooth Vertical Surfaces**

Borjindakul, P., Ji, A., Dai, Z., Gorb, S. N. & Manoonpong, P., 30. Sep 2021, In: *Frontiers in Bioengineering and Biotechnology*. 9, 5 p., 765718.

### **Design, analysis, and neural control of a bionic parallel mechanism**

Zhu, Y., Zhou, S., Poramate, M. & Li, R., Sep 2021, In: *Frontiers of Mechanical Engineering*. 16, 3, p. 468-486

### **Echo State Networks for Estimating Exteroceptive Conditions From Proprioceptive States in Quadruped Robots**

Calandra, M., Patanè, L., Sun, T., Arena, P. & Manoonpong, P., 23. Aug 2021, In: *Frontiers in Neurobotics*. 15, 17 p., 655330.

### **Versatile modular neural locomotion control with fast learning**

Thor, M. & Manoonpong, P., 16. Jul 2021, In: *arxiv.org*.

**No Need for Landmarks: An Embodied Neural Controller for Robust Insect-Like Navigation Behaviors**  
Xiong, X. & Manoonpong, P., 15. Jul 2021, (E-pub ahead of print) In: I E E E Transactions on Cybernetics. p. 1-12

**Editorial: Integrated Multi-modal and Sensorimotor Coordination for Enhanced Human-Robot Interaction**  
Fang, B., Fang, C., Wen, L. & Manoonpong, P., 15. Apr 2021, In: Frontiers in Neurobotics. 15, 673659.

**A Comparative Study of Adaptive Interlimb Coordination Mechanisms for Self-Organized Robot Locomotion**  
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**VENOM: Versatile, adhesive, and soft material for various surface adhesion**  
Suthisomboon, T., Rukpanich, T., Asawalertsak, N., Borijindakul, P., Ji, A., Dai, Z. & Manoonpong, P., 12. Apr 2021, *2021 IEEE 4th International Conference on Soft Robotics, RoboSoft 2021*. IEEE, p. 543-546 4 p. 9479242

**A Low-Cost, Compact, Sealed, Three-axis Force/Torque Sensor for Walking Robots**  
Billeschou, P., Albertsen, C., Larsen, J. C. & Manoonpong, P., 1. Apr 2021, In: IEEE Sensors Journal. 21, 7, p. 8916-8926 11 p.

**Getting grip in changing environments: the effect of friction anisotropy inversion on robot locomotion**  
Tramsen, H. T., Heepe, L., Homchanthanakul, J., Wörgötter, F., Gorb, S. N. & Manoonpong, P., Apr 2021, In: Applied Physics A: Materials Science and Processing. 127, 9 p., 389.

**Integrating Non-spiking Interneurons in Spiking Neural Networks**  
Strohmer, B., Stagsted, R. K., Manoonpong, P. & Larsen, L. B., 5. Mar 2021, In: Frontiers in Neuroscience. 15, 16 p., 633945.

**A Variable Soft Finger Exoskeleton for Quantifying Fatigue-induced Mechanical Impedance**  
Xiong, X. & Manoonpong, P., 2021, *2021 International Conference on Robotics and Automation (ICRA 2021)*, IEEE. IEEE , p. 10347-10352 (I E E E International Conference on Robotics and Automation).

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**Autobot for Effective Design Space Exploration and Agile Generation of RBFNN Hardware Accelerator in Embedded Real-Time Computing**  
Huang, N. S., Larsen, J. C. & Manoonpong, P., 30. Dec 2020, *2020 IEEE International Conference on Real-time Computing and Robotics (RCAR)*. IEEE, p. 339-344

**Adaptive parallel reflex- and decoupled CPG-based control for complex bipedal locomotion**  
Akkawutvanich, C., Knudsen, F. I., Riis, A. F., Larsen, J. C. & Manoonpong, P., Dec 2020, In: Robotics and Autonomous Systems. 134, 12 p., 103663.

**Decoding EEG Rhythms during Action Observation, Motor Imagery, and Execution for Standing and Sitting**  
Chaisaen, R., Autthasan, P., Mingchinda, N., Leelaarporn, P., Kunaseth, N., Tammajarung, S., Manoonpong, P., Mukhopadhyay, S. C. & Wilaiprasitporn, T., 15. Nov 2020, In: I E E E Sensors Journal. 20, 22, p. 13776-13786

**Generic Mechanism for Waveform Regulation and Synchronization of Oscillators: An Application for Robot Behavior Diversity Generation**  
Zhu, Y., Zhang, L. & Manoonpong, P., 10. Nov 2020, (E-pub ahead of print) In: IEEE Transactions on Cybernetics.

**Framework for developing bio-inspired morphologies for walking robots**  
Billeschou, P., Bijma, N. N., Larsen, L. B., Gorb, S. N., Larsen, J. C. & Manoonpong, P., 7. Oct 2020, In: Applied Sciences (Switzerland). 10, 19, 20 p., 6986.

#### **End-to-End Rapid FPGA Prototyping for Embedded Proactive BMI Control**

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#### **Virtual Motoneuron Activation for Goal-directed Locomotion of a Hexapod Robot**

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#### **General Distributed Neural Control and Sensory Adaptation for Self-Organized Locomotion and Fast Adaptation to Damage of Walking Robots**

Miguel-Blanco, A. & Manoonpong, P., 17. Aug 2020, In: *Frontiers in Neural Circuits*. 14, 17 p., 46.

#### **Flexible Spiking CPGs for Online Manipulation During Hexapod Walking**

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#### **Rules for the Leg Coordination of Dung Beetle Ball Rolling Behaviour**

Leung, B., Bijma, N., Baird, E., Dacke, M., Gorb, S. & Manoonpong, P., 9. Jun 2020, In: *Scientific Reports*. 10, 1, p. 9278 8 p., 9278.

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#### **Error-Based Learning Mechanism for Fast Online Adaptation in Robot Motor Control**

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#### **Bio-Inspired Adaptive Locomotion Control System for Online Adaptation of a Walking Robot on Complex Terrains**

Ngamkajornwivat, P., Homchanthanakul, J., Teerakittikul, P. & Manoonpong, P., 6. May 2020, In: *IEEE Access*. 8, p. 91587-91602 9088155.

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#### **Hybrid soft-rigid foot with dry adhesive material designed for a gecko-inspired climbing robot**

Shao, D., Chen, J., Ji, A., Dai, Z. & Manoonpong, P., May 2020, *3rd IEEE International Conference on Soft Robotics, RoboSoft 2020*. IEEE, p. 578-585 9116045

#### **SMOOTH Robot: Design for a novel modular welfare robot**

Juel, W. K., Haarslev, F., Ramirez, E. R., Marchetti, E., Fischer, K., Shaikh, D., Manoonpong, P., Hauch, C., Bodenhausen, L. & Krüger, N., 1. Apr 2020, In: *Journal of Intelligent and Robotic Systems*. 98, p. 19-37

#### **A Single-Channel Consumer-Grade EEG Device for Brain-Computer Interface: Enhancing Detection of SSVEP and Its Amplitude Modulation**

Autthasan, P., Du, X., Arnin, J., Lamyai, S., Perera, M., Itthipuripat, S., Yagi, T., Manoonpong, P. & Wilaiprasitporn, T., 15. Mar 2020, In: *IEEE Sensors Journal*. 20, 6, p. 3366-3378

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### **An Explicit Local and Global Representation Disentanglement Framework with Applications in Deep Clustering and Unsupervised Object Detection**

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### **Dynamical State Forcing on Central Pattern Generators for Efficient Robot Locomotion Control**

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### **Editorial: Biology-Inspired Engineering and Engineering-Inspired Biology**

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### **ICrawl: An Inchworm-Inspired Crawling Robot**

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### **Integrating Non-Spiking Interneurons in Spiking Neural Networks**

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### **Investigating Partner Diversification Methods in Cooperative Multi-agent Deep Reinforcement Learning**

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### **Robust actuator fault diagnosis algorithm for autonomous hexacopter UAVs**

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### **Neural Control for Gait Generation and Adaptation of a Gecko Robot**

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### **A fast online frequency adaptation mechanism for cpg-based robot motion control**

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### **CPG Driven RBF Network Control with Reinforcement Learning for Gait Optimization of a Dung Beetle-Like Robot**

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### **Effiziente Fortbewegung durch Reibungsanisotropien - Einfluss von Matrialelastizität, Oberflächengeometrie und Substratrauhigkeit**

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### **Modular Neural Control for Dung Beetle-like Leg Movements of a Dung Beetle-like Robot**

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### **Muscles Can be Brakes: the Work Loop Technique for Stable Muscle-like Control**

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### **Neural Control with an Artificial Hormone System for Energy-Efficient Compliant Terrain Locomotion and Adaptation of Walking Robots**

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### **Unterschiedliche Spezialisierung der Mistkäferextremitäten zum Laufen**

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### **Bio-inspired design and movement generation of dung beetle-like legs**

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### **A dung beetle-inspired robotic model and its distributed sensor-driven control for walking and ball rolling**

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### **Adaptive neural control for self-organized locomotion and obstacle negotiation of quadruped robots**

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### **Development of Autonomous Drones for Adaptive Obstacle Avoidance in Real World Environments**

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### **Lateral undulation of the flexible spine of sprawling posture vertebrates**

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### **Modular Neural Mechanisms for Gait Phase Tracking, Prediction, and Selection in Personalizable Knee-Ankle-Foot-Orthoses**

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### **The SMOOTH Robot: Design for a Novel Modular Welfare Robot**

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### **Cylindrical Terrain Classification Using a Compliant Robot Foot with a Flexible Tactile-Array Sensor for Legged Robots**

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### **Development of a real-time motor-imagery-based EEG brain-machine interface**

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### **Neural Control and Synaptic Plasticity for Adaptive Obstacle Avoidance of Autonomous Drones**

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### **Online Gait Adaptation of a Hexapod Robot Using an Improved Artificial Hormone Mechanism**

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## Prizes

**Sky Talent (“长空英才”)**  
Manoonpong, Poramate (Recipient), 2018

**The Scandinavian Guest Professorship (Skandinavische Gastdozentur)**  
Manoonpong, Poramate (Recipient), 2015

## Projects

**DLife: A dung beetle's life: how miniature creatures perform extraordinary feats with limited resources**  
Manoonpong, P. & Larsen, J.  
01/11/2017 → 31/10/2021

**Health-CAT: Health Care Assisting Technology**  
Manoonpong, P., Bodenhausen, L., Juel, W. K., Haarslev, F., Palinko, O., Krüger, N., Kollakidou, A. & Naik, L.  
01/02/2017 → 15/11/2020

**SMOOTH: Innovation fund Denmark: Seamless huMan-robot interactiOn fOr THE support of elderly people**  
Krüger, N. & Manoonpong, P.  
01/04/2017 → 31/03/2020

**NEUrorobotic Technology for advanced Robot mOtor coNtrol**  
Manoonpong, P.  
01/05/2018 → 30/04/2021

**Plan4Act: Predictive Neural Information for Proactive Actions: From Monkey Brain to Smart House Control**  
Manoonpong, P. & Larsen, J.  
01/01/2017 → 31/12/2020

**SMOOTH: Seamless huMan-robot interactiOn fOr THE support of elderly people**  
Bodenhausen, L., Palinko, O., Manoonpong, P., Haarslev, F., Krüger, N., Juel, W. K., Kollakidou, A. & Naik, L.  
01/04/2017 → 31/01/2021

**SpikeCPG**  
Larsen, L. B., Strohmer, B. & Manoonpong, P.  
01/02/2019 → 28/02/2022

## Teaching and supervision

**Adaptive embodied locomotion control systems**

Poramate Manoonpong  
01/09/2014 → ...

### **Bachelor, Master, PhD supervisions**

Poramate Manoonpong  
01/01/2012 → ...

### **RT-UAR Underactuated Robotics**

Leon Bonde Larsen & Jürgen Herp  
01/02/2018 → 01/06/2018

### **Tools of Artificial intelligence**

Poramate Manoonpong  
01/02/2014 → ...

## **Activities**

### **PhD examination committee**

Poramate Manoonpong (Examiner)  
21. Feb 2020

### **Censor of Master thesis**

Poramate Manoonpong (Examiner)  
17. Jan 2020

### **Frontiers in Robotics and AI (Journal)**

Poramate Manoonpong (Peer reviewer)  
2020

### **Human-Robot Interaction for Medical Robotics (Online lecture)**

Poramate Manoonpong (Guest lecturer)  
2020

### **Embodied neural mechanisms for adaptive, versatile, autonomous behaviors of bio-inspired walking robots**

Poramate Manoonpong (Guest lecturer)  
23. Dec 2019

### **NEUTRON: NEUrorobotic Technology for advanced Robot mOtor control**

Poramate Manoonpong (Guest lecturer)  
7. Jun 2019

### **Mathematics and Robotics: From Numbers to Complex Robot Behaviors & Learning**

Poramate Manoonpong (Guest lecturer)  
15. May 2019

### **Embodied neural mechanisms for adaptive, versatile, autonomous behaviors of bio-inspired walking robots**

Poramate Manoonpong (Guest lecturer)  
11. Apr 2019

### **PhD examination committee**

Poramate Manoonpong (Examiner)

7. Jan 2019

**DLife: Dung beetle-inspired robot development**  
Poramate Manoonpong (Guest lecturer)  
2019

**Frontiers in Neurorobotics (Journal)**  
Poramate Manoonpong (Peer reviewer)  
2019

**IEEE (External organisation)**  
Poramate Manoonpong (Member)  
2019

**The Youth Commission of International Society of Bionic Engineering (External organisation)**  
Poramate Manoonpong (Member)  
2019

**NEUrorobotic Technology for advanced Robot mOtor control (NEUTRON)**  
Poramate Manoonpong (Guest lecturer)  
4. Dec 2018

**Bio-inspired Artificial Intelligence for Service Robots**  
Poramate Manoonpong (Guest lecturer)  
21. Nov 2018 → 24. Nov 2018

**Robotic technology for the elderly and the disabled**  
Poramate Manoonpong (Guest lecturer)  
1. Jun 2018

**Neural locomotion control of walking robots**  
Poramate Manoonpong (Guest lecturer)  
18. May 2018

**Adaptive Behavior (Journal)**  
Poramate Manoonpong (Peer reviewer)  
2018

**Frontiers in Neurorobotics (Journal)**  
Poramate Manoonpong (Peer reviewer)  
2018

**The 2nd International Youth Conference of Bionic Engineering (IYCBE2018)**  
Poramate Manoonpong (Participant)  
2018

**The first joint workshop on Biology-inspired robotics and Robotics-inspired Biology (BIRRIB)**  
Poramate Manoonpong (Participant)  
2018

**Exploiting frictional anisotropy from a scale-like material for energy-efficient robot locomotion**  
Poramate Manoonpong (Guest lecturer)  
13. Dec 2017 → 17. Dec 2017



**From a dung beetle to a multifunctional robot: A bio-inspired approach**

Poramate Manoonpong (Guest lecturer)  
29. Oct 2017

**Exploiting frictional anisotropy from a passive scale-like material for energy-efficient locomotion of a bio-inspired walking robot**

Poramate Manoonpong (Guest lecturer)  
28. Jun 2017

**Workshop on Bio-inspired Robotics**

Jørgen Christian Larsen (Organizer) & Poramate Manoonpong (Organizer)  
24. Jun 2017

**Building neural circuits for bio-inspired bodies**

Poramate Manoonpong (Guest lecturer)  
15. Jun 2017

**Enhanced Locomotion Efficiency of a Bio-inspired Walking Robot using Contact Surfaces with Frictional Anisotropy**

Poramate Manoonpong (Guest lecturer)  
13. Jun 2017 → 14. Jun 2017

**Bio-inspired Robotics: From Biology to Technology**

Poramate Manoonpong (Guest lecturer)  
5. Jan 2017

**Intelligent Robots: Machines that Act, Learn, and Adapt by themselves**

Poramate Manoonpong (Lecturer)  
8. Dec 2016

**Embodied AI & Neurorobotics**

Poramate Manoonpong (Lecturer)  
25. Nov 2016

**Learning from a Dung beetle to Advance Robot Development**

Poramate Manoonpong (Lecturer)  
10. Nov 2016

**Bio-inspired adaptive combinatorial learning for goal-directed behaviors**

Poramate Manoonpong (Lecturer)  
8. Nov 2016

**Embodied neural mechanisms for adaptive, versatile, autonomous behaviors of bio-inspired walking robots**

Poramate Manoonpong (Lecturer)  
28. Sep 2016

**PhD examination committee**

Poramate Manoonpong (Examiner)  
16. Sep 2016

**Exploiting Neural Mechanisms: "From neural dynamics and synaptic plasticity to adaptive locomotion: An embodied neural computation approach"**

Poramate Manoonpong (Speaker)  
23. Aug 2016

**Exploiting Soft Materials, Biomechanical Structures, and Neural Mechanisms for Adaptive Locomotion: Lessons Learned From Nature**

Poramate Manoonpong (Organizer)  
23. Aug 2016

**The 14th International Conference on the Simulation of Adaptive Behavior**

Jørgen Christian Larsen (Organizer) & Poramate Manoonpong (Organizer)  
23. Aug 2016

**Biologically inspired robots**

Poramate Manoonpong (Lecturer)  
5. Jun 2016 → 9. Jun 2016

**Reinforcement Learning**

Poramate Manoonpong (Lecturer)  
14. Apr 2016

**Locomotion in invertebrates and robots**

Poramate Manoonpong (Other)  
9. Mar 2016

**Tools of Artificial intelligence (RMAI2-U1)**

Poramate Manoonpong (Lecturer)  
5. Feb 2016 → ...

**Embodied neural computation for locomotion and navigation of insect-like robots**

Poramate Manoonpong (Lecturer)  
21. Jan 2016

**Research topic on Neural Computation in Embodied Closed-Loop Systems for the Generation of Complex Behavior: From Biology to Technology (Journal)**

Poramate Manoonpong (Editor)  
2016

**Bio-inspired robotics for the factory of the future**

Poramate Manoonpong (Speaker)  
15. Dec 2015

**Sharing experience & knowledge**

Poramate Manoonpong (Speaker)  
14. Dec 2015

**Locomotion in invertebrates and robots**

Poramate Manoonpong (Participant)  
25. Nov 2015 → 26. Nov 2015

**PhD thesis examiner**

Poramate Manoonpong (Advisor)  
19. Nov 2015

**From Neural Dynamics and Synaptic Plasticity to Complex Behaviors: An Embodied Neural Computation Approach**

Poramate Manoonpong (Lecturer)  
18. Nov 2015

**Neural Dynamics and Synaptic Plasticity**

Poramate Manoonpong (Lecturer)  
18. Nov 2015

**Building neural circuits for complex behaviors of walking robots**

Poramate Manoonpong (Lecturer)  
17. Nov 2015

**Neural Control, Learning, and Memory for Complex Behaviors of Bio-inspired Walking Machines**

Poramate Manoonpong (Speaker)  
2. Nov 2015

**Embodied Artificial Intelligence**

Poramate Manoonpong (Other)  
Nov 2015 → Feb 2016

**Embodied sensorimotor interaction: from locomotion to collective behavior workshop**

Poramate Manoonpong (Organizer)  
28. Oct 2015

**Plasticity in a recurrent neural network for complex behaviors of a walking robot**

Poramate Manoonpong (Speaker)  
28. Oct 2015

**Self-organized sensorimotor coordination for adaptive locomotion of artificial behaving machines**

Poramate Manoonpong (Lecturer)  
27. Oct 2015

**Christian-Albrechts-University Kiel**

Poramate Manoonpong (Visiting researcher)  
1. Oct 2015 → 29. Feb 2016

**Adaptive Embodied Locomotion Control Systems (RMAI3-U1)**

Poramate Manoonpong (Lecturer)  
4. Sep 2015 → ...

**Project in Artificial Intelligence (RMAI4-U1)**

Poramate Manoonpong (Lecturer)  
Sep 2015 → ...

**Robotic technology**

Poramate Manoonpong (Speaker)  
3. Aug 2015

**How to do research**

Poramate Manoonpong (Lecturer)  
Aug 2015 → ...

**Bio-inspired robotics**

Poramate Manoonpong (Lecturer)  
22. Jul 2015

**Bio-inspired robotics**

Poramate Manoonpong (Lecturer)  
14. Jul 2015

**King Mongkut's University of Technology Thonburi (KMUTT)**

Poramate Manoonpong (Visiting researcher)  
21. Jun 2015 → 17. Aug 2015

**Multiple Decoupled CPGs with Local Sensory Feedback for Adaptive Locomotion Behaviors of Bio-inspired Walking Robots**

Poramate Manoonpong (Speaker)  
29. May 2015

**Embodied Artificial Intelligence Workshop**

Poramate Manoonpong (Speaker)  
11. May 2015

**Reinforcement Learning**

Poramate Manoonpong (Lecturer)  
22. Apr 2015

**Tools of Artificial intelligence (RMAI2-U1)**

Poramate Manoonpong (Lecturer)  
6. Feb 2015 → ...

**Bio-inspired Robots**

Poramate Manoonpong (Lecturer)  
8. Jan 2015

**Associate Editor of Frontiers in Neurobotics (Journal)**

Poramate Manoonpong (Editor)  
2015 → ...

**Associate Editor of Frontiers in Neurobotics (Journal)**

Poramate Manoonpong (Peer reviewer)  
2015

**Bachelor thesis co-supervisor & co-examiner**

Poramate Manoonpong (Advisor)  
2015

**Neural Control, Learning, and Memory of Bio-inspired Walking Robots**

Poramate Manoonpong (Lecturer)  
18. Dec 2014

**Neural Control, Learning, and Memory for Complex Behaviors of Autonomous Walking Robots**

Poramate Manoonpong (Lecturer)  
21. Nov 2014

**Adaptive Embodied Locomotion Control Systems (RMAI3-U1)**

Poramate Manoonpong (Lecturer)  
2014 → ...

**Tools of Artificial intelligence (RMAI2-U1)**

Poramate Manoonpong (Lecturer)

2014 → ...

**Editorial Board of Advances in Robotics Research (ARR) (Journal)**

Poramate Manoonpong (Peer reviewer)

2013 → ...

**Editorial Board of International Journal of Advanced Robotic Systems (Journal)**

Poramate Manoonpong (Peer reviewer)

2013 → ...