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Academic Qualification:

Ph.D. in Electrical Engineering, March 1997

Department of Automatic Control, Beijing Institute of Technology, Beijing, China.

Master's Degree in Electrical Engineering, December 1993

Department of Automation, Yanshan University (former Northeast Heavy Machinery Institute), Qinhuangdao, China.

Bachelor's Degree in Electrical Engineering, July 1991

Department of Automation, Yanshan University, Qinhuangdao, China.

Research Area

Robotics & Intelligent Systems.
Medical Robots: Rehabilitation & Surgical Robots.
Computational Intelligence and Applications.

Working Experience

Professor, June 2004 - Present

Institute of Automation, The Chinese Academy of Sciences, Beijing, China.

Visiting Professor, September 2003 - October 2004

Intelligent Systems Research Laboratory, Department of Mechanical Engineering, University of Saskatchewan, Saskatoon, Saskatchewan, Canada.

Associate Professor, July 1999 - May 2004

Institute of Automation, The Chinese Academy of Sciences, Beijing, China.

Research Assistant, May 2000 - January 2001

The Hong Kong Polytechnic University, Kowloon, Hong Kong, China.

Postdoctoral Fellow, May 1997 - July 1999

Institute of Systems Science, The Chinese Academy of Sciences, Beijing, China.

Academic Publication（selected）

Referred Journal Papers:

[1] Wang, J., Wang, W., and **Hou, Z.G.**, “EEG-based focus of attention tracking and regulation during dual-task training for neural rehabilitation of stroke patients,” IEEE Transactions on Biomedical Engineering, 2022, doi: 10.1109/TBME.2022.3205066.

[2] Zou, A., Liu, Y., **Hou, Z.G.**, and Hu, Z., “Practical predefined-time output-feedback consensus tracking control for multiagent systems,” *IEEE Transactions on Cybernetics* , 2022, doi: 10.1109/TCYB.2022.3207325.

[3] Fan, C., Yang, H., Peng, L., Zhou, X., Ni, Z., Zhou, Y., Chen, S., and **Hou, Z.G.**, “BGL-Net: A brain-inspired global-local information fusion network for Alzheimer's disease based on sMRI,” *IEEE Transactions on Cognitive and Devel- opmental Systems* , 2022,

[4] Zhang, J., Liu, M., Xiong, P., Du, H., Yang, J., Xu, J., **Hou, Z.G**., and Liu, X., “Automated localization of myocardial infarction from vectorcardiographic via tensor decomposition,” IEEE Transactions on Biomedical Engineering, 2022, doi:

[5] Wang, C., Peng, L., **Hou, Z.G.**, Li, Y., Tan Y., and Hao, H., “A control framework for adaptation of training task and robotic assistance for promoting motor learning with an upper limb rehabilitation robot”, IEEE Transactions on Systems, Man, and Cybernetics:

[6] Zhou, X., Xie, X., Liu, S., Ni, Z., Zhou, Y., Li, R., Gui, M., Fan, C., Feng, Z., Bian, G., **Hou, Z.G.**, “Learning skill characteristics from manipulations”, IEEE Transactions on Neural Networks and Learning Systems, 2022.

[7] Wang, J., Shi, L., Wang, W., **Hou, Z.G.**, “Efficient brain decoding based on adaptive EEG channel selection and transformation”, *IEEE Transactions on Emerging Topics in Computational Intelligence* , 2022, doi: 10.1109/TETCI.2022.3147225.

[8] Wang, W., Liang, X., Liu, S., Lin, T., Zhang, P., Lv, Z., Wang, J., **Hou, Z.G.**, “Drivable space of rehabilitation robot for physical human–robot interaction: Definition and an expanding method,” IEEE Transactions on Robotics, 2022, doi:

[9] Wang, C., Peng, L., **Hou, Z.G.**, Li, Y., Tan Y., and Hao, H., “A hierarchical architecture for multi-symptom assessment of early Parkinson's disease via wearable sensors”, IEEE Transactions on Cognitive and Developmental Systems, 2021, doi:

[10] Xie, X., Wu, Y., and **Hou, Z.G.**, “Further results on adaptive practical tracking for high- order nonlinear systems with full-state constraints,” *IEEE Transactions on Cybernetics* , vol. 52, no. 10, pp. 9978-9985, Oct. 2022, doi:

[11] Gui, M., Zhou, X., Xie, X., Liu, S., Li, H., Xiang, T., Wang, J., **Hou, Z.G.**, “Design and experiments of a novel Halbach-cylinder-based magnetic skin: A preliminary study”, IEEE Transactions on Instrumentation and Measurement, 2022, vol. 71, pp. 1-11, Art no.

[12] Wang, G., Hu, Q., Yang, Y., Cheng, J., **Hou, Z.G.**, “Adversarial binary mutual learning for semisupervised deep hashing”, IEEE Transactions on Neural Networks and Learning Systems, August 2022, vol. 33, no. 8, pp. 4110-4124, doi: 10.1109/

[13] Wang, Y., Tang, C., Wang, S., Cheng, L., Wang, R., Tan, M., and **Hou, Z.G.**, “Target tracking control of a biomimetic underwater vehicle through deep reinforcement learning”, IEEE Transactions on Neural Networks and Learning Systems, vol. 33, no. 8, pp. 3741-3752, Aug. 2022, doi: 10.1109/TNNLS.2021.3054402.

[14] Fan, C., Peng, L., Wang, T., Yang, H., Zhou, X., Ni, Z., Wang, G., Chen, S., Zhou, Y., **Hou, Z.G.**, “R-GAN: Multi-session future MRI prediction with temporal recur- rent generative adversarial network,” IEEE Transactions on Medical Imaging, August 2022,vol. 41, no. 8, pp. 1925-1937. doi: 10.1109/TMI.2022.3151118.

[15] Ni, Z., Bian, G., Li, Z., Zhou, X., Li, R., and **Hou, Z.G.**, “Space squeeze reasoning and low-rank bilinear feature fusion for surgical image segmentation”, IEEE Journal of Biomedical and Health Informatics, vol. 26, no. 7, pp. 3209-3217, July 2022, doi:

[16] Zhou, X., Xie, X., Liu, S., Feng, Z., Gui, M., Wang, J., Li, H., Xiang, T., Bian, G., and **Hou, Z.G.**, “Surgical skill assessment based on dynamic warping manipulations”, IEEE Transactions on Medical Robotics and Bionics, vol. 4, no. 1, pp. 50-61, Feb. 2022, doi:
[17] Liang, X., He, G., Su, T., Wang, W., Huang, C., Zhao, Q., and **Hou, Z.G.**, “Finite-time observer-based variable impedance control of cable-driven continuum manipulators”, IEEE Transactions on Human-Machine Systems, vol. 52, no. 1, pp. 26-40, Feb. 2022, doi:
[18] Wu, J., Yan, Y., Zhang, D., Liu, B., Zheng, Q., Xie, X., Liu, S., Ge, S., **Hou, Z.G.**, and Xia, N., “Machine learning for structure determination in single-particle cryo- electron microscopy: A systematic review,” *IEEE Transactions on Neural Networks and Learning*
[19] Zhang, J., Liu, M., Xiong, P., Du, H., Zhang, H., Sun, G., **Hou, Z.G.**, and Liu, X., “Automated localization of myocardial infarction of image-based multilead ECG tensor with Tucker2 decomposition”, *IEEE Transactions on Instrumentation and Measurement* , vol.
[20] Li, R., Xie, X., Zhou, X., Liu, S., Ni, Z., Zhou, Y., Bian, G., Hou, Z.G., “A u- nified framework for multi-guidewire endpoint localization in fluoroscopy images,” IEEE Transactions on Biomedical Engineering, vol. 69, no. 4, pp. 1406-1416, April 2022, doi:
[21] Wang, J., Wang, W., Ren, S., Shi, W., **Hou, Z.G.**, “Neural correlates of single-task ver-sus cognitive-motor dual-task training”, IEEE Transactions on Cognitive and Developmental Systems, vol. 14, no. 2, pp. 532-540, June 2022, doi: 10.1109/
[22] Zhou, X., Xie, X., Feng, Z., **Hou, Z.G.**, Bian, G., Li, R., Ni, Z., Liu, S., and Zhou, Y., “A multilayer and multimodal-fusion architecture for simultaneous recognition of endovascular manipulations and assessment of technical skills”, *IEEE Transactions on*
[23] Wang, Y., Tang, C., Wang, S., Cheng, L., Wang, R., Tan, M., **Hou, Z.G.**, “Tar- get tracking control of a biomimetic underwater vehicle through deep reinforcemen- t learning,” IEEE Transactions on Neural Networks and Learning Systems, 2021, doi:
[24] Guo, C., Xie, X., and **Hou, Z.G.**, “Removing feasibility conditions on adaptive neural tracking control of nonlinear time-delay systems with time-varying powers, input, and full-state constraints”, IEEE Transactions on Cybernetics, vol. 52, no. 4, pp. 2553- 2564, April
[25] Wu, Y., Xie, X., and **Hou, Z.G.**, “Adaptive fuzzy asymptotic tracking control of state-constrained high-order nonlinear time-delay systems and its applications”, IEEE Transactions on Cybernetics, March 2022, vol. 52, no. 3, pp. 1671-1680, doi:
[26] Zhang, J., Liu, M., Xiong, P., Du, H., Zhang, H., Sun, G., **Hou, Z.G.**, and Liu, X., “Automated localization of myocardial infarction of image-based multilead ECG tensor with Tucker2 decomposition”, *IEEE Transactions on Instrumentation and Measurement* , vol.
[27] Wang, H., Wang, S., Liu, H., Rhode, K., **Hou, Z.G.**, and Rajamani, R., “3-D electromagnetic position estimation system using high-magnetic-permeability metal for continuum medical robots”, IEEE Robotics and Automation Letters, vol. 7, no. 2, pp. 2581-
[28] Zhou, X., Xie, X., Liu, S., Feng, Z., Gui, M., Wang, J., Li, H., Xiang, T., Bian, G., **Hou, Z.G.**, “Surgical skill assessment based on dynamic warping manipulation- s”, IEEE Transactions on Medical Robotics and Bionics, vol. 4, no. 1, pp. 50-61, Feb. 2022, doi:
[29] Liang, X., He, G., Su, T., Wang, W., Huang, C., Zhao, Q., and **Hou, Z.G.**, “Finite-time observer-based variable impedance control of cable-driven continuum manipulators,” IEICE Transactions on Information and Systems, vol. 52, no. 1, pp. 26-40, Feb. 2022, doi:
[30] Wu, J., Yan, Y., Zhang, D., Liu, B., Zheng, Q., Xie, X., Liu, S., Ge, S., **Hou, Z.G.**, and Xia, N., “Machine learning for structure determination in single-particle cryo-electron microscopy: a systematic review,” *IEEE Transactions on Neural Networks and Learning*
[31] Wang, C., Peng, L., **Hou, Z.G.**, and Zhang, P., “The assessment of upper-limb spastic- ity based on a multi-layer process using a portable measurement system”, IEEE Transactions on Neural Systems and Rehabilitation Engineering, vol. 29, pp. 2242- 2251,

[32] Zhou, Y., Xie, X., Zhou, X., Liu, S., Bian, G., and **Hou, Z.G.**, “A real-time multi-functional framework for guidewire morphological and positional analysis in interven- tional X-ray fluoroscopy,” *IEEE Transactions on Cognitive and Developmental Systems* , vol. 13,
[33] Li, R, Xie, X., Zhou, X., Liu, S., Ni, Z., Zhou, Y., Bian, G., **Hou, Z.G.**, “Real- time multi-guidewire endpoint localization in fluoroscopy images”, *IEEE Transactions on Medical Imaging* , vol. 40, no. 8, pp. 2002-2014, Aug. 2021, doi: 10.1109/T-
[34] Sun, T., Peng, L., Cheng, L., **Hou, Z.G.** and Pan, Y., “Stability-guaranteed vari- able impedance control of robots based on approximate dynamic inversion”, *IEEE Transactions on Systems, Man, and Cybernetics: Systems* , vol. 51, no. 7, pp. 4193- 4200,
[35] Cheng, L., Liu, Y., **Hou, Z.G.**, et al, “A rapid spiking neural network approach with an application on hand gesture recognition”, *IEEE Transactions on Cognitive and Developmental Systems* , vol. 13, no. 1, pp. 151-161, March 2021, doi: 10.1109/TCD-
[36] Wang, W., Shi, W., Ren, S., **Hou, Z.G.**, Liang, X., Wang, J., and Peng, L., “GPR and SPSO-CG based gait pattern generation for subject-specific training”, Science China, Information Science, August 2021, vol. 64, pp. 189204:1-3.
[37] Wang, W., Shi, W., **Hou, Z.G.**, Chen, B., Ren, S., Liang, X., Wang, J., and Peng, L., “Prediction of human voluntary torques based on collaborative neuromusculoskeletal modeling and adaptive learning”, *IEEE Transactions on Industrial Electronics* , vol. 68, no.
[38] Wang, S., Wang, K., Tang, R., Qiao, J., Liu, H., and **Hou, Z.G.**, “Design of a low-cost miniature robot to assist the COVID-19 nasopharyngeal swab sampling”, IEEE Transactions on Medical Robotics and Bionics, February 2021, vol. 3, no. 1, pp. 289-293.
[39] Wang, S., Housden, J., Bai, T., Liu, H., Back, J., Singh, D., Rhode, K., **Hou, Z.G.**, Wang, F., “Robotic intra-operative ultrasound: virtual environments and parallel sys- tems”, IEEE/CAA Journal of Automatica Sinica, vol. 8, no. 5, pp. 1095-1106, May 2021, doi:
[40] Cheng, L., Liu, W., Zhou, C., Zou, Y., and **Hou, Z.G.**, “Automated silicon-substrate ultra-microtome for automating the collection of brain sections in array tomography”, IEEE/CAA Journal of Automatica Sinica, February 2021, vol. 8, no. 2, pp. 389-401.
[41] Fan, C., Yang, H., **Hou, Z.G.**, Ni, Z., Chen, S., and Fang, Z., “Bilinear neural network with 3-D attention for brain decoding of motor imagery movements from the human EEG”, Cognitive Neurodynamics (Springer), 2021, vol. 15, no. 1, pp. 181-189.
[42] Wang, J., Wang, W., Ren, S., Shi, W., **Hou, Z.G.**, “Engagement enhancement based on human-in-the-loop optimization for neural rehabilitation”, *Frontiers in Neurorobotics* , November 12, 2020, vol. 14, 596019, https://doi.org/10.3389/fnbot.
[43] Wang, J., Wang, W., and Hou, Z.G., “Towards improving engagement in neural reha- bilitation: Attention enhancement based on brain-computer interface and audiovisual feedback”, IEEE Transactions on Cognitive and Developmental Systems, vol. 12, no. 4,
[44] Chi, J.,Liu, Jo,Wang, F., Chi, Y. and **Hou, Z.G.**, “3D gaze estimation method us- ing a multi-camera-multi-light-source system”, *IEEE Transactions on Instrumentation and Measurement* , vol. 69, no. 12, pp. 9695-9708, Dec. 2020.
[45] Zhou, Y., Xie, X., Zhou, X., Liu, S., Bian, G., Hou, Z.G., “Pyramid attention recurrent networks for real-time guidewire segmentation and tracking in intraoperative X-ray fluoroscopy”, Computerized Medical Imaging and Graphics, July 2020, vol. 83, No.
[46] Wang, G., Yang, Y., Zhang, T., Cheng, J., **Hou, Z.G.**, Tiwari, P., Pandey, H., “Cross-modality paired-images generation and augmentation for RGB-infrared person re-identification”, Neural Networks, Aug. 2020, vol. 128, pp. 294-304.
[47] Wang, A., Cheng, L., Yang, C., **Hou, Z.G.**, “An adaptive fuzzy predictive controller with hysteresis compensation for piezoelectric actuators”, Cognitive Computation, Ju- ly 2020, vol. 12, no. 4, pp. 736-747.

[48] Ren, S., Wang, W., **Hou, Z.G.**, Liang, X., Wang, J., and Shi, W., “Enhanced motor imagery based brain-computer interface via FES and VR for lower limbs”,IEEE Transactions on Neural Systems and Rehabilitation Engineering, Aug. 2020, vol. 28, no. 8,
[49] Zhou, X., Bian, G., Xie, X., and **Hou, Z.G.**, “An interventionalist-behavior-based data fusion framework for guidewire tracking in percutaneous coronary intervention”, IEEE Transactions on Systems, Man, and Cybernetics: Systems, 2020, vol. 50, no. 11, pp. 4836-
[50] Sun, T., Cheng, L., Peng, L., **Hou, Z.G.**, Pan, Y., “Learning impedance control of robots with enhanced transient and steady-state control performances”, Science China, Information Science, 2020, vol. 63, no. 9, pp. 192205:1-13.
[51] Wang, C., Peng, L., **Hou, Z.G.**, Li, J., Zhang, T., and Zhao, J., “Quantitative assessment of upper-limb motor function for post-stroke rehabilitation based on motor syn- ergy analysis and multi-modality fusion”, IEEE Transactions on Neural Systems and Rehabilitation Engineering, vol. 28, no. 4, pp. 943-952, April 2020.
[52] Liu, H., Cheng, L., Tan, M., and **Hou, Z.G.**, “Exponential finite-time consensus of fractional-order multiagent systems”, *IEEE Transactions on Systems, Man, and Cybernetics: Systems* , vol. 50, no. 4, pp. 1549-1558, April 2020.
[53] Sun, T., Peng, L., Cheng, L., **Hou, Z.G.**, and Pan, Y., “Composite learning enhanced robot impedance control”, IEEE Transactions on Neural Networks and Learning Systems, vol. 31, no. 3, pp. 1052-1059, March 2020.
[54] Zhou, X., Bian, G., Xie, X., **Hou, Z.G.**, Li, R., and Zhou, Y., “Qualitative and quantitative assessment of technical skills in percutaneous coronary intervention: In vivo porcine studies,” IEEE Transactions on Biomedical Engineering, vol. 67, no. 2, pp. 353-
[55] Luo, L., Peng, L., Wang, C., and **Hou, Z.G.**, “A greedy assist-as-needed controller for upper limb rehabilitation”, *IEEE Transactions on Neural Networks and Learning Systems* , vol. 30, no. 11, pp. 3433-3443, Nov. 2019.
[56] Zhou, X., Bian, G., Xie, X., **Hou, Z.G.**, Qu, X., and Guang, S., “Analysis of interventionalists'natural behaviors for recognizing motion patterns of endovascular tools during percutaneous coronary interventions”, *IEEE Transactions on Biomedical Circuits*
[57] Cui, C., Bian, G., **Hou, Z.G.**, Zhao, J., Su, G., Zhou, H., Peng, L., and Wang, W., “Simultaneous recognition and assessment of post-stroke hemiparetic gait by fusing kinematic, kinetic and electrophysiological data”, *IEEE Transactions on Neural Systems and*
[58] Cheng, L., Liu, W., Yang, C., Huang, T., **Hou, Z.G.**, Tan, M., “A neural-network-based controller for piezoelectric-actuated stick-slip devices”, *IEEE Transactions on Industrial Electronics* , 2018, vol. 65, no. 3, pp. 2598-2607.
[59] Yang, J., Bai, Y., Lin, F., Liu, M., **Hou, Z.G.**, and Liu, X., “A novel electrocardiogram arrhythmia classification method based on stacked sparse auto-encoders and softmax regression”, International Journal of Machine Learning and Cybernetics, 2018, vol. 9,
[60] Liu, M., Hao, H., Xiong, P., Lin, F., **Hou, Z.G.**, and Liu, X., “Constructing a guided filter by exploiting the Butterworth filter for ECG signal enhancement”, Journal of Medical and Biological Engineering, 2018, vol. 38, no. 6, pp. 980-992.
[61] Hao, J., Xie, X., Bian, G., **Hou, Z.G.**, and Zhou, X., “Development and Evaluation of a 7-DOF Haptic Interface”, IEEE/CAA Journal of Automatica Sinica, vol. 5, no. 1, pp. 261-269, Jan. 2018.
[62] Cheng, X., Xie, X., Bian, G., **Hou, Z.G.**, Liu, S., and Gao, Z., “A simulator with an elastic guidewire and vascular system for minimally invasive vascular surgery”, Science in China Series F: Information Sciences, 2018, vol. 61, no. 10, pp. 104201.
[63] Cui, C., Bian, G., **Hou, Z.G.**, Zhao, J., and Zhou, H., “A multimodal framework based on integration of cortical and muscular activities for decoding human intentions about lower limb motions”, *IEEE Transactions on Biomedical Circuits and Systems* ,

[64] Cheng, L., Liu, W., **Hou, Z.G.**, Huang, T., Yu, J., Tan, M., "An adaptive Takagi-Sugeno fuzzy model-based predictive controller for piezoelectric actuators", *IEEE Transactions on Industrial Electronics* , April 2017, vol. 64, no. 4, pp. 3048-3058.
[65] An, N., Sun, S., Zhao, X., **Hou, Z.G.**, "Remember like humans: Visual tracking with cognitive psychological memory model", *International Journal of Advanced Robotic Systems* , February 14, 2017, vol. 14, no. 1, pp. 1-9.
[66] Peng L., **Hou, Z.G.**, Peng L., Luo, L., Wang, W, "Robot assisted rehabilitation of the arm after stroke: prototype design and clinical evaluation", *Science in China, Inf Sci* , 2017, 60(7), pp. 073201.
[67] An, N., Zhao, X., **Hou, Z.G.**, "3D tracker-level fusion for robust RGB-D tracking", IEICE Transactions on Information and Systems, Aug. 2017, vol. E100D, no. 8, pp. 1870-1881.
[68] Liu, Q., Zhao, X., **Hou, Z.G.**, Liu, H., "Epileptic seizure detection based on the kernel extreme learning machine", *Technology and Health Care: official journal of the European Society for Engineering and Medicine* , 2017-Jul-20, vol. 25, no. S1, pp. 399-409.
[69] F. Zhang, **Hou, Z.G.**, L. Cheng, W. Wang, Y. Chen, J. Hu, L. Peng, and H. Wang, "iLeg - a lower limb rehabilitation robot: A proof of concept", *IEEE Transactions on Human-Machine Systems* , vol. 46, no. 5, pp. 761-768, 2016.
[70] W. Wang, **Hou, Z.G.**, L. Cheng, L. Tong, L. Peng, L. Peng, and M. Tan, "Toward patients' motion intention recognition: dynamics modeling and identification of iLeg - an LLRR under motion constraints", *IEEE Transactions on Systems, Man, and Cybernetics:*
[71] L. Cheng, H. Wang, **Hou, Z.G.**, and M. Tan, "Reaching a consensus in network- s of high-order integral agents under switching directed topologies", *International Journal of Systems Science* , vol. 47, pp. 1966-1981, 2016.
[72] Wang Y, Cheng L, Yang C, **Hou, Z.G.**, and M. Tan, "Reaching a stochastic consensus in the noisy networks of linear MIMO agents: Dynamic output-feedback and conver- gence rate," Science China, Technological Sciences, 2016, vol. 59, no. 1, pp. 45-
[73] L. Cheng, Y. Wang, W. Ren, **Hou, Z.G.**, and M. Tan, "Containment control of multiagent systems with dynamic leaders based on a PI^n-type approach,"IEEE Transactions on Cybernetics, vol. 46, no. 12, pp. 3004 - 3017, 2016.
[74] L. Cheng, Y. Wang, W. Ren, **Hou, Z.G.**, and M. Tan, "On convergence rate of leader- following consensus of linear multi-agent systems with communication noises," IEEE Transactions on Automatic Control, vol. 61, no. 11, pp. 3586 - 3592, 2016.
[75] W. Liu, L. Cheng, **Hou, Z.G.**, J. Yu, and M. Tan, "An inversion-free predictive controller for piezoelectric actuators based on a dynamic linearized neural network model," IEEE/ASME Transactions on Mechatronics, vol. 21, no. 1, pp. 214-226, 2016.
[76] Y. Wang, L. Cheng, **Hou, Z.G.**, J. Yu, and M. Tan, "Optimal formation of mul- tirobot systems based on a recurrent neural network," *IEEE Transactions on Neural Networks and Learning Systems* , vol. 27, no. 2, pp. 322-333, 2016.
[77] Xiong, P., Wang, H., Liu, M., Zhou, S., **Hou, Z.G.**, Liu, X., "ECG signal enhancement based on improved denoising auto-encoder", *Engineering Applications of Arti- ficial Intelligence* , vol. 52, pp. 194-202, June 1, 2016.
[78] Xie, X., Bian, G., **Hou, Z.G.**, Feng, Z., Hao, J., "Preliminary study on Wilcoxon- norm-based robust extreme learning machine", Neurocomputing, vol. 198, pp. 20-26, 2016.

[79] Kasabov, N., Scott, N.M., Tu, E., Marks, S., Sengupta, N., Capecci, E., Othmana, M., Doborjeh, M.G., Murli, N., Hartono, R., Espinosa-Ramos, J.I., Zhou, L., Alvi, F.B., Wang, G., Taylor, D., Feigin, V., Gulyaev, S., Mahmoudh, M., **Hou, Z.G.**, Yang, J., "Evolving spatio-temporal data machines based on the NeuCube neuromorphic framework: Design methodology and selected applications", Neural Networks, 2016, vol. 78, pp. 1-14

[80] **Hou, Z.G.**, Zhao, X., Cheng, L., Wang, Q., Wang, W., "Recent advances in rehabilitation robots and intelligent assistance systems", *Acta Automatica Sinica* , vol. 42, no. 12, pp. 1765-1779, December 1, 2016. Chinese

[81] Luo, L., **Hou, Z.G.**, Wang, W., Peng, L., "A gait trajectory adaptation algorithm based on nonlinear oscillator", *Acta Automatica Sinica* , 2016, vol. 42, no. 12, pp. 1951-1959. Chinese

[82] Liu, M., Li, G., Hao, H., **Hou, Z.G.**, Liu, X., "T wave shape classification based on convolutional neural network", *Acta Automatica Sinica* , vol. 42, no. 9, pp. 1339-1346,September 1, 2016. Chinese

[83] L. Cheng, W. Liu, **Hou, Z.G.**, J. Yu, and M. Tan, "Neural-network-based nonlinear model predictive control for piezoelectric actuators," *IEEE Transactions on Industrial Electronics* , vol. 62, pp. 7717-7727, 2015.

[84] H. Liu, L. Cheng, M. Tan, and **Hou, Z.G.**, "Containment control of continuous-time linear multi-agent systems with aperiodic sampling," Automatica, vol. 57, pp. 78-84, 2015.

[85] H. Liu, L. Cheng, M. Tan, **Hou, Z.G.**, and Y. Wang, "Distributed exponential finite-time coordination of multi-agent systems: Containment control and consensus," International Journal of Control, vol. 88, pp. 237-247, 2015.

[86] L. Tong, F. Zhang, **Hou, Z.G.**, W. Wang, and L. Peng, "BP-AR-based human join- t angle estimation using multi-channel sEMG," *International Journal of Robotics and Automation* , vol. 30, 2015.

[87] Y. Wang, L. Cheng, **Hou, Z.G.**, M. Tan, C. Zhou, and M. Wang, "Consensus seeking in a network of discrete-time linear agents with communication noises," International Journal of Systems Science, vol. 46, pp. 1874-1888, 2015/07/27 2015.

[88] Y. Wang, L. Cheng, W. Ren, **Hou, Z.G.**, and M. Tan, "Seeking consensus in networks of linear agents: Communication noises and Markovian switching topologies," IEEE Transactions on Automatic Control, vol. 60, pp. 1374-1379, 2015.

[89] Z. Zhao, X. Feng, Y. Lin, F. Wei, S. Wang, T. Xiao, et al., "Evolved neural network ensemble by multiple heterogeneous swarm intelligence," Neurocomputing (Elsevier), vol. 149, pp. 29-38, 2015.

[90] Q. Li, Y. Song, and **Hou, Z.G.**, "Estimation of lower limb periodic motions from sEMG using least squares support vector regression", Neural Process Letters (Springer), 2015, vol. 41, pp. 371-388.

[91] Q. Li, Y. Song, and **Hou, Z.G.**, "Neural network based FastSLAM for autonomous robots in unknown environments", Neurocomputing (Elsevier), 2015, vol. 165, pp. 99-110.

[92] Wang, J., Zeng, Z., **Hou, Z.G.**, "Advances in neural networks", Neurocomputing (Elsevier), Part A, p 1-2, February 3, 2015.

[93] Peng, L., **Hou, Z.G.**, Wang, W., "Synchronous active interaction control and its implementation for a rehabilitation robot", Acta Automatica Sinica, vol. 41, no. 11, pp. 1837-1846, November 1, 2015. Chinese

[94] Solo, Ashu M.G., Gupta, M.M., Homma, N., **Hou, Z.G.**, "Type-one fuzzy logic for quantitatively defining imprecise linguistic terms in politics and public policy", Re- search Methods: Concepts, Methodologies, Tools, and Applications, pp. 67-83, Jan- uary 1, 2015.

[95] Wang, X., **Hou, Z.G.**, Zeng, H., Lü, F., Pan, S., "Fault diagnosis of robots based on multi-sensor information fusion", Journal of Shanghai Jiaotong University, vol. 49, no. 6, pp. 793-798, June 28, 2015. Chinese

[96] Fu, S., He, H., and **Hou, Z.G.**, "Learning race from face: a survey", *IEEE Transactions on Pattern Analysis and Machine Intelligence* , 2014, vol. 36, no. 12, pp. 2483- 2509.

[97] Liu, Q., Zhao, X., and **Hou, Z.G.**, "Survey of single-target visual tracking methods based on online learning", IET Computer Vision, 2014, vol. 8, no. 5, pp. 419-428.

[98] Wang, Y., Cheng, L., **Hou, Z.G.**, Tan, M., Wang, M., "Containment control of multi-agent systems in a noisy communication environment", *Automatica* , 2014, vol. 50, no. 7, pp. 1922-1928.

[99] Kasabov, N., Feigin, V., **Hou, Z.G.**, Chen, Y., Liang, L., Krishnamurthi, R., Otham, M. and Parmar, P., "Evolving spiking neural networks for personalised modelling, classification and prediction of spatio-temporal patterns with a case study on stroke", Neurocomputing (Elsevier), 2014, vol. 134, pp. 269-279.

[100] Hu, J., Hou, Z.G., Chen, Y., Zhang, F., Wang W., "Lower limb rehabilitation robots and interactive control methods", Acta Automatica Sinica, 2014, vol. 40, no. 11, pp. 2377-390.

[101] Tong, L., **Hou, Z.G.**, Peng, L., Wang, W., Chen, Y., and Tan, M., "Multi-channel sEMG time series analysis based human motion recognition method", Acta Auto- matica Sinica, 2014, vol. 40, no. 5, pp. 810-821. (in Chinese)

[102] Cheng, L., **Hou, Z.G.**, and Tan, M., "A mean square consensus protocol for linear multi-agent systems with communication noises and fixed topologies", *IEEE Transactions on Automatic Control* , 2014, vol. 59, no. 1, pp. 261-267.

[103] Wang, X., **Hou, Z.G.**, Lv, F., Tan, M., Wang, Y., "Mobile robots' modular navigation controller using spiking neural networks", Neurocomputing (Elsevier), 2014, vol. 134, pp. 230-238.

[104] Wang, W., **Hou, Z.G.**, Tong, L., Zhang, F., Chen, Y., Tan, M., "A novel leg orthosis for lower limb rehabilitation robots of the sitting/lying type", *Mechanism and Machine Theory* (Elsevier), April 2014, vol. 74, pp. 337 - 353.

[105] Cheng, L., Wang, Y., **Hou, Z.G.**, Tan, M., Cao, Z., "Sampled-data based average con- sensus of second-order integral multi-agent systems: Switching topologies and communication noises", *Automatica* , 2013, vol. 49, no. 5, pp. 1458-1464.

[106] Dai, D., He, H., Vogelstein, J.T., Hou, Z.G., "Accurate prediction of AD patients using cortical thickness networks", Machine Vision and Applications (Springer), 2013, vol. 24, no. 7, pp. 1445 - 1457.

[107] Zhao, Z., Feng, X., Wei, F., Lin, Y., Li, Y., **Hou, Z.G.** and Tan, M., "Learning representative features for robot topological localization", *International Journal of Advanced Robotic Systems* , 2013, vol. 10, 215, DOI: 10.5772/56324

[108] Zhao, Z., Feng, X., Lin, Y., Wei, F., Wang, S., Xiao, T., Cao, M., **Hou, Z.G.** and Tan, M., "Improved Rao-Blackwellized particle filter by particle swarm optimization", Journal of Applied Mathematics, vol. 2013, no. 302170, DIO: 10.1155/2013/302170

[109] Zhou, C., **Hou, Z.G.**, Cao, Z., Wang, S., Tan, M., “Motion modeling and neural networks based yaw control of a biomimetic robotic fish”, Information Sciences (Elsevi- er), 2013, vol. 237, pp. 39 - 48.
[110] Zou, A., Dev Kumar, K., and **Hou, Z.G.**, “Distributed consensus control for multi-agent systems using terminal sliding mode and Chebyshev neural networks”, International Journal of Robust and Nonlinear Control (Wiley), 2013, vol. 23, no. 3, pp. 334-357.
[111] Zhou, C., Cao, Z., **Hou, Z.G.**, Wang, S., Tan, M., “Backward swimming gaits for a carangiform robotic fish”, Neural Computing & Applications (Springer), 2013, vol. 23, nos. 7-8, pp. 2015-2021.
[112] Zhao, Z., Zhang, L., Zhao, M., **Hou, Z.G.**, Zhang, C., “Gabor face recognition by multi-channel classifier fusion of supervised kernel manifold learning”, Neurocomputing (Elsevier), 2012, vol. 97, pp. 398-404.
[113] Zou, A., Dev Kumar, K., and **Hou, Z.G.**, “Attitude coordination control for a group of spacecraft without velocity measurements”, *IEEE Transactions on Control Systems Technology* , 2012, vol. 20, no. 5, pp. 1160-1174.
[114] Zou, A., Dev Kumar, K., **Hou, Z.G.**, “Erratum: Attitude coordination control for a group of spacecraft without velocity measurements”, *IEEE Transactions on Control Systems Technology* , vol. 21, no. 3, pp. 1044, 2013.
[115] Cheng, L., **Hou, Z.G.**, Tan, M., Zhang, W.J., “Tracking control of a closed-chain five- bar robot with two degrees of freedom by integration of an approximation-based approach and mechanical design”, *IEEE Transactions on Systems, Man, and Cybernetics,*
[116] Cheng, L., Lin, Y., **Hou, Z.G.**, Tan, M., Huang, J., Zhang, W.J., “Integrated design of machine body and control algorithm for improving the robustness of a closed-chain five-bar machine”, IEEE/ASME Transactions on Mechatronics, 2012, vol. 17, no. 3, pp. 587-
[117] Zhang, F., Li, P., **Hou, Z.G.**, Lu, Z., Chen, Y., Li, Q., Tan, M., “sEMG-based continu- ous estimation of joint angles of human legs by using BP neural network”, Neurocomputing (Elsevier), 2012, vol. 78, no. 1, pp. 139 - 148.

[118] Cheng, L., **Hou, Z.G.**, Lin, Y., Tan, M., Zhang, W., “Solving a modified consensus problem of linear multi-agent systems”, Automatica, 2011, vol. 47, no. 10, pp. 2218- 2223.

[119] **Hou, Z.G.**, L. Cheng, Z. Zeng and M. Tan., Editorial to Special Issue: Biomedi- cal Engineering: Information Processing, Modeling, and Control, *Neural Computing & Applications* (Springer), 2011, vol. 20, no. 8, pp. 1129-1130.
[120] Cheng, L., Lin, Y., **Hou, Z.G.**, Tan, M., Huang, J., and Zhang, W., “Adaptive tracking control of hybrid machines: a closed-chain five-bar mechanism case”, IEEE/ASME Transactions on Mechatronics, 2011, vol. 16, no. 6, pp. 1155-1163. (regular
[121] Cheng, L., **Hou, Z.G.**, Tan, M., and Wang, X., “Necessary and sufficient conditions for consensus of double-integrator multi-agent systems with measurement noises”, *IEEE Transactions on Automatic Control* , 2011, vol. 56, no. 8, pp. 1958-1963.
[122] Zou, A., Dev Kumar, K., **Hou, Z.G.**, and Liu, X., “Finite-time attitude tracking control for spacecraft using terminal sliding mode and Chebyshev neural network”, IEEE Transactions on Systems, Man and Cybernetics, Part B: Cybernetics, 2011, vol. 41, no. 4,
[123] Zou, A., Kumar, K., **Hou, Z.G.**, “Corrections to ”Finite-time attitude tracking control for spacecraft using terminal sliding model and chebyshev neural network” (IEEE Transactions on Cybernetics)”, IEEE Transactions on Cybernetics, vol. 43, no. 2, pp. 803,
[124] Cheng, L., **Hou, Z.G.**, Lin, Y., Tan, M., Zhang, W., Wu, F., “Recurrent neural network for non-smooth convex optimization problems with application to the identification of genetic regulatory networks”, IEEE Transactions on Neural Networks, 2011, vol. 22, no.

[125] M.M. Gupta, N. Homma, **Hou, Z.G.**, and I. Bukovsky, Editorial to Special Issue: Cog- nitive and Neural Aspects in Robotics with Applications, Journal of Robotics, 2010, Article ID 623140, DOI:10.1155/2010/623140.
[126] Zou, A., Dev Kumar, K., **Hou, Z.G.**, "Quaternion-based adaptive output feedback attitude control of spacecraft using Chebyshev neural networks", *IEEE Transactions on Neural Networks* , 2010, vol. 21, no. 9, pp. 1457 - 1471.
[127] Cheng, L., **Hou, Z.G.**, Tan, M., Lin, Y., and Zhang, W., "Neural-network-based adap- tive leader-following control for multiagent systems with uncertainties", IEEE Transactions on Neural Networks, 2010, vol. 21, no. 8, pp. 1351- 1358.
[128] **Hou, Z.G.**, Cheng, L., Tan, M., "Multicriteria optimization for coordination of redundant robots using a dual neural network", *IEEE Transactions on Systems, Man and Cybernetics, Part B: Cybernetics* , 2010, vol. 40, no. 4, pp. 1075-1087.
[129] Zhao, Z.S., **Hou, Z.G.**, Zhao, X., Tan, M., "Topological localisation based on monoc- ular vision and unsupervised learning", *International Journal of Advanced Mechatronic Systems* , 2010, vol. 2, no. 1/2, pp. 59 - 67.
[130] Fu, S., Yang, G., Hou, Z.G., "Image category learning and classification via optimal linear combination of multiple partially matching kernels", Soft Computing (Springer), 2010, vol. 14, no. 2, pp. 181-192.
[131] Cheng, L., **Hou, Z.G.**, and Tan, M., "Adaptive neural network tracking control for manipulators with uncertain kinematics, dynamics and actuator model", Automatica, 2009, vol. 45, no. 10, pp. 2312-2318.
[132] Cheng, L., Hou, Z.G., and Tan, M., "A delayed projection neural network for solving linear variational inequalities", IEEE Transactions on Neural Networks, 2009, vol. 20, no. 6, pp. 915-925.
[133] **Hou, Z.G.**, Zou, A., Cheng, L., Tan, M., "Adaptive control of an electrically driven nonholonomic mobile robot via backstepping and fuzzy approach", *IEEE Transaction on Control Systems Technology* , 2009, vol. 17, no. 4, pp. 803-815.
[134] Li, E., Liang, Z., **Hou, Z.G.**, and Tan, M., "Energy-based balance control approach to the ball and beam system", International Journal of Control, 2009, vol. 82, no. 6, pp. 981 - 992.
[135] Fu, S., **Hou, Z.G.**, Liang, Z., Tan, M., Jing, F., Zuo, Q., Zhang, Y., "Image-based visual servoing for power transmission line inspection robot", International Journal of Modelling, Identification and Control, 2009, vol. 6, no. 3, pp. 239 - 254.

[136] Cheng, L., **Hou, Z.G.**, and Tan, M., "A simplified neural network for linear matrix inequality problems", Neural Processing Letters, 2009, vol. 29, no. 3, pp. 213-230.

[137] **Hou, Z.G.**, Z., Zeng, C., Sun, Editorial to Special Issue: Computational Intelligence for Optimization, Modeling and Control. Neural Computing & Applications, 2009, vol. 18, no. 5, pp. 407-408.
[138] Cheng, L., **Hou, Z.G.**, and Tan, M., "Solving linear variational inequalities by projection neural network with time-varying delays", Physics Letters A, 2009, vol. 373, no. 20, pp. 1739-1743.
[139] **Hou, Z.G.**, Cheng, L., Tan, M., "Decentralized robust adaptive control for the multiagent system consensus problem using neural networks", IEEE Transactions on Systems, Man, and Cybernetics, Part B: Cybernetics, 2009, vol. 39, no. 3, pp. 636- 647.
[140] Cheng, L., **Hou, Z.G.**, and Tan, M., "A neutral-type delayed projection neural network for solving nonlinear variational inequalities", IEEE Transactions on Circuits and Systems, Part II: Express Briefs, 2008, vol. 55, no. 8, pp. 806-810.

[141] Zou, A., **Hou, Z.G.**, and Tan, M. “Adaptive control of a class of nonlinear pure-feedback systems using fuzzy backstepping approach”, *IEEE Transactions on Fuzzy Systems* , 2008, vol. 16, no. 4, pp. 886-897. (regular paper)
[142] Ma, J., Yang, T., **Hou, Z.G.**, Tan, M., and Liu, D., “Neurodynamic programming: a case study of the traveling salesman problem”, Neural Computing & Applications (Springer), 2008, vol. 17, no. 4, pp. 347-355.
[143] **Hou, Z.G.**, M. M. Polycarpou, H. He, Editorial to Special Issue: Neural networks for pattern recognition and data mining. Soft Computing (Springer), 2008, vol. 12, no. 7, pp. 613-614.
[144] Wang, X., **Hou, Z.G.**, Zou, A., Tan, M., and Cheng, L., “A behavior controller for mobile robot based on spiking neural networks”, Neurocomputing (Elsevier), 2008, vol. 71, issues 4-6, pp. 655-666.
[145] Cheng, L., **Hou, Z.G.**, and Tan, M., “ Constrained multi-variable generalized predictive control using a dual neural network”, Neural Computing & Applications (Springer), 2007, vol. 16, no. 6, pp. 505-512.
[146] **Hou, Z.G.**, Gupta, M.M., Nikiforuk, P.N., Tan, M., and L. Cheng, “A recurrent network for hierarchical control of interconnected dynamic systems”, *IEEE Transactions on Neural Networks* , 2007, vol. 18, no. 2, pp. 466-481. (regular paper)
[147] **Hou, Z.G.**, Song, K.Y., Gupta, M.M., and Tan, M., “Neural units with higher-order synaptic operations for robotic image processing applications”, Soft Computing (Springer), 2007, vol. 11, no. 3, pp. 221-228.

Referred Conference Papers:

[1] J. Zheng, S. Wang, J. Housden, **Hou, Z.G.**, D. Singh and K. Rhode, “A safety joint with passive compliant and manual override mechanisms for medical robotics“, 2021 IEEE International Conference on Intelligence and Safety for Robotics (ISR), 2021, pp. 1-4, doi: 10.1109/ISR50024.2021.9419379.

[2] Ni, Z., Bian, G., **Hou, Z.G.**, Zhou, X., Xie, X., Li, Z., “Attention-guided lightweight network for real-time segmentation of robotic surgical instruments”, Proceedings of the 2020 IEEE International Conference on Robotics and Automation (ICRA), pp. 9939 - 9945, May 31 - August 31, 2020, Paris, France, Virtual Conference.
[3] Zhou, X., Xie, X., Feng, Z., **Hou, Z.G.**, Bian, G., Li, R., Ni, Z., Liu, S., Zhou, Y., “A multilayer-multimodal fusion architecture for pattern recognition of natural manip- ulations in percutaneous coronary interventions”, IEEE International Conference on Robotics and Automation (ICRA), pp. 3039 - 3045, May 31 - August 31, 2020, Paris, France, Virtual Conference.
[4] Ni, Z., Bian, G., Wang, G., Zhou, X., **Hou, Z.G.**, Xie. X., Wang. Y., “BARNet: bilinear Attention Betwork With Adaptive Receptive Fields For Surgical Instrument Segmentation”, Proceedings of the Twenty-Ninth International Joint Conference on Artificial Intelligence (IJCAI), pp. 832 - 838, January 2020, Yokohama, Japan.

[5] Wang, G., Gong, S., Cheng, J. and **Hou, Z.G.**, “Faster person re-identification”, Proceedings of 16th European Conference on Computer Vision (ECCV), pp. 275-292, August, 2020, Glasgow, UK, Virtual Conference.

[6] Wang, G., Zhang, T., Yang, Y., Cheng, J., Liang, X., **Hou, Z.G.**, "Cross-modality paired-images generation for rgb-infrared person re-Identification", Proceedings of the AAAI Conference on Artificial Intelligence (AAAI), pp. 12144 - 12151, February, 2020, New York, USA.

[7] Ni, Z., Bian, G., Wang, G., Zhou, X., **Hou, Z.G.**, Chen, H., Xie, X., "Pyramid attention aggregation network for semantic segmentation of surgical instruments", Proceedings of the AAAI Conference on Artificial Intelligence, 34 (7), pp. 11782-11790, February, 2020, New York, USA.

[8] Fang, Z., Wang, W., Ren, S., Wang, J., Shi, W., Liang, X., Fan, C., **Hou, Z.G.**, "Learning regional attention convolutional neural network for motion intention recognition based on EEG data", Proceedings of the Twenty-Ninth International Joint Conference on Artificial Intelligence (IJCAI), pp. 1570-1576, January 2020, Yokohama, Japan.

[9] Xu, N., Peng, X., Peng, L., **Hou, Z.G.**, Gui, M., Modeling and kinematics analysis of a novel 5-DOF upper limb exoskeleton rehabilitation robot", Proceedings of 39th Chinese Control Conference (CCC), pp. 1052-1057, July, 2020, Shenyang, China.

[10] Zhou, Y., Xie, X., **Hou, Z.G.**, Zhou, X., Bian, G., Liu, S., "Lightweight double attention-fused networks for intraoperative stent segmentation", Proceedings of Inter- national Conference on Medical Image Computing and Computer-Assisted Interven- tion (MICCAI), pp. 3-13, November, 2020, Lima, Peru, Virtual Conference.

[11] Zhou, Y., Xie, X., Bian, G., **Hou, Z.G.**, "A lightweight recurrent attention network for real-time guidewire segmentation and tracking in interventional x-ray fluoroscopy", Proceedings of the 24th European Conference on Artificial Intelligence (ECAI), pp. 2848-2855, August, 2020, Santiago, Chile.

[12] Zhou Y., Xie, X., **Hou, Z.G.**, Bian, G., Liu, S., Zhou, X., "FRR-NET: fast recur- rent residual networks for real-time catheter segmentation and tracking in endovas- cular aneurysm pepair", Proceedings of 2020 IEEE 17th International Symposium on Biomedical Imaging (ISBI), pp. 961-964. April, 2020, Lowa City, USA.

[13] Li, R., Bian, G., Zhou, X., Xie, X., Ni, Z., **Hou, Z.G.**, "CAU-net: a novel convolutional neural network for coronary artery segmentation in digital substraction angiography", Proceedings of the 27th International Conference on Neural Information Processing (ICONIP), Part I pp. 185-196, November 23-27, 2020, Bangkok, Thailand, Virtual Conference.

[14] Wei, S., Sun, X., Zhou, X., **Hou, Z.G.**, "A novel vascular robotic system: performance evaluation", Proceedings of the 27th International Conference on Neural Information Processing (ICONIP), Part II pp. 727-737, November 23-27, 2020, Bangkok, Thai- land, Virtual Conference.

[15] Li, R., Zhou, X., Bian, G., Xie, X., **Hou, Z.G.**, "Recognition of endovascular manipulations using recurrent neural networks", Proceedings of the 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), pp. 7010-7013, July 23-27, 2019, Berlin, Germany.

[16] Liang, X., Wang, W., **Hou, Z.G.**, Ren, S., Wang, J., Shi, W., Peng, L., Su, T., "Position based impedance control strategy for a lower limb rehabilitation robot", Proceedings of the 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), pp. 437-441, July 23-27, 2019, Berlin, Germany.

[17] Ni, Z., Bian, G., Xie, X., **Hou, Z.G.**, Zhou, X., Zhou, Y., “RASNet: segmentation for tracking surgical instruments in surgical videos using refined attention segmentation network”, Proceedings of the 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), pp. 5735-5738, July 23-27, 2019, Berlin, Germany.

[18] Wang, G., Zhang, T., Cheng, J., Liu, S., Yang, Y., **Hou, Z.G.**, “RGB-infrared cross-modality person re-identification via joint pixel and feature alignment”, Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV), pp. 3622-3631, October 27 - November 2, 2019, Seoul, Korea (South).

[19] Fang, Z., Wang, W., **Hou, Z.G.**, “Convolutional LSTM: a deep learning method for motion intention recognition based on spatiotemporal EEG data”, Proceedings of Neu- ral Information Processing - 26th International Conference (ICONIP), Part 4 pp. 216- 224, December 12-15, 2019, Sydney, NSW, Australia.

[20] Liang, X., Wang, W., **Hou, Z.G.**, Ren, S., Wang, J., Shi, W., Su, T., “Adaptive estimation of human-robot interaction force for lower limb rehabilitation”, Proceedings of Neural Information Processing - 26th International Conference (ICONIP), Part 4 pp. 540-547, December 12-15, 2019, Sydney, NSW, Australia.

[21] Ni, Z., Bian, G., Zhou, X., **Hou, Z.G.**, Xie, X., Wang, C., Zhou, Y., Li, R., Li, Z., “RAUNet: residual attention U-Net for semantic segmentation of cataract surgical instruments”, Proceedings of Neural Information Processing - 26th International Conference (ICONIP), Part 2 pp. 139-149, December 12-15, 2019, Sydney, NSW, Australia.

[22] Wang, W., **Hou, Z.G.**, Shi, W., Liang, X., Ren, S., Wang, J., Peng, L., “Neuromuscular activation based SEMG-torque hybrid modeling and optimization for robot assisted neuro rehabilitation”, Proceedings of Neural Information Processing - 26th Interna- tional Conference (ICONIP), Part 2 pp. 591-602, December 12-15, 2019, Sydney, NSW, Australia.

[23] Zhou, Y., Xie, X., Bian, G., **Hou, Z.G.**, Liu, B., Lai, Z., Qu, X., Liu, S., Zhou, X., “Real-time guidewire segmentation and tracking in endovascular aneurysm repair”, Proceedings of Neural Information Processing - 26th International Conference (I- CONIP), Part 1 pp. 491-500, December 12-15, 2019, Sydney, NSW, Australia.

[24] Wang, J., Wang, W., **Hou, Z.G.**, Shi, W., Liang, X., Ren, S., Peng, L., Zhou, Y., “B- CI and multimodal feedback based attention regulation for lower limb rehabilitation”, Proceedings of the International Joint Conference on Neural Networks (IJCNN), pp. 1-7, July 14-19, 2019 Budapest, Hungary.

[25] Zhou, Y., Xie, X., Bian, G., **Hou, Z.G.**, Wu, Y., Liu, S., Zhou, X., Wang, J., “Fully automatic dual-guidewire segmentation for coronary bifurcation lesion”, Proceedings of the International Joint Conference on Neural Networks (IJCNN), pp. 1-6, July 14- 19, 2019 Budapest, Hungary.

[26]Huang, R., Bian, G., Xin, C., Li, Z., ***Hou, Z.G.****, “Path planning for surgery robot with bidirectional continuous tree search and neural network”, Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), pp. 3302-3307, November 3-8, 2019, Macau, SAR, China.*

[27] Li, R., Bian, G., Zhou, X., Xie, X., Ni, Z., **Hou, Z.G.**, “A two-stage framework for real-time guidewire endpoint localization”, Proceedings of the 22nd International Con- ference on Medical Image Computing and Computer Assisted Intervention (MICCAI), pp. 357-365 October 13-17, Shenzhen, China.

[28] Sun, N., Cheng, L., Tian, L., **Hou, Z.G.**, Tan, M., “Design and validation of an asymmetric bowden-cable-driven series elastic actuator”, Proceedings of the IEEE International Conference on Robotics and Biomimetics (ROBIO), pp. 852-857, December 6-8, 2019, Dali, China.

[29] Guo, J., **Hou, Z.G.**, Xie, X., Yao, S., Wang, Q., Jin, X., “Faster R-CNN based indoor flame detection for firefighting robot”, Proceedings of the IEEE Symposium Series on Computational Intelligence (SSCI), pp. 1390-1395, December 6-9, 2019, Xiamen, China.

[30] Liang, X., **Hou, Z.G.**, Ren, S., Shi, W., Wang, W., Wang, J., Su, T., “Damping control based speed adjustment strategy for a lower limb rehabilitation robot”, Proceedings of the IEEE Symposium Series on Computational Intelligence (SSCI), pp. 1140-1145, December 6-9, 2019, Xiamen, China.

[31] Wang, C., Peng, L., **Hou, Z.G.**, Wang, W., Su, T., “A novel assist-as-needed controller based on fuzzy-logic inference and human impedance identification for upper-limb rehabilitation”, Proceedings of the IEEE Symposium Series on Computational Intelligence (SSCI), pp. 1133-1139, December 6-9, 2019, Xiamen, China.

[32] Wang, C., Peng, L., **Hou, Z.G.**, Li, J., Luo, L., Chen, S., Wang, W., “Kinematic redundancy analysis during goal-directed motion for trajectory planning of an upper-limb exoskeleton robot”, Proceedings of the 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), pp. 5251-5255, July 23-27, 2019, Berlin, Germanv.

[33] Wang, C., Peng, L., **Hou, Z.G.**, Luo, L., Chen, S., Wang, W., “sEMG-based torque estimation using time-delay ANN for control of an upper-limb rehabilitation robot”, Proceedings of the 2018 IEEE International Conference on Cyborg and Bionic Systems (CBS), pp. 585-591, October 25-27, 2018, Shenzhen, China.

[34] Wang, C., Peng, L., Luo, L., **Hou, Z.G.**, Wang, W., “Genetic algorithm based dynamics modeling and control of a parallel rehabilitation robot”, Proceedings of the 2018 IEEE Congress on Evolutionary Computation (CEC), pp. 1-6, July 8-13, 2018, Rio de Janeiro, Brazil.

[35] Wang, G., Hu, Q., Cheng, J., **Hou, Z.G.**, “Semi-supervised generative adversarial hashing for image retrieval”, Proceedings of the 15th European Conference on Com- puter Vision (ECCV), Part XV pp. 491-507, September 8-14, 2018, Munich, Germany.

[36] Wang, J., Wang, W., **Hou, Z.G.**, Liang, X., Ren, S., Peng, L., “Towards enhancement of patients'engagement: online modification of rehabilitation training modes using facial expression and muscle fatigue”, Proceedings of the 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), pp. 2304-2307, July 18-21, 2018, Honolulu, HI, USA.

[37] Wu, K., Bian, G., Xu, J., Ye, Y., Gao, S., Yan, Y., **Hou, Z.G.**, "Physiological tremor suppression for the manipulation of an ophthalmology robot: a comparison study", Proceedings of the 3rd International Conference on Advanced Robotics and Mechatronics (ICARM), pp. 107-111, July 18-20, 2018, Singapore City, Singapore.

[38] Liang, X., Wang, W., **Hou, Z.G.**, Xu, Z., Ren, S., Wang, J., Peng, L., "Dynamics based fuzzy adaptive impedance control for lower limb rehabilitation robot", Proceedings of the 25th International Conference on Neural Information Processing (ICONIP), Part VII pp. 316-326, December 13-16, 2018, Siem Reap, Cambodia.

[39] Peng, L., Wang, C., Luo, L., Chen, S., **Hou, Z.G.**, Wang, W., "Adaptive modeling and control of an upper-limb rehabilitation robot using RBF neural networks", Proceedings of the 25th International Conference on Neural Information Processing (ICONIP), Part VII pp. 235-245, December 13-16, 2018, Siem Reap, Cambodia.

[40] Ren, S., Wang, W., **Hou, Z.G.**, Liang, X., Wang, J., Peng, L., "Anthropometric features based gait pattern prediction using random forest for patient-specific gait training", Proceedings of the 25th International Conference on Neural Information Processing (ICONIP), Part IV pp. 15-26, December 13-16, 2018, Siem Reap, Cambodia.

[41] Wang, C., Peng, L., **Hou, Z.G.**, Luo, L., Chen, S., Wang, W., "Experimental validation of minimum-jerk principle in physical human-robot interaction", Proceedings of the 25th International Conference on Neural Information Processing (ICONIP), Part VII pp. 499-509, December 13-16, 2018, Siem Reap, Cambodia.

[42] Wang, J., Wang, W., **Hou, Z.G.**, Liang, X., Ren, S., Peng, L., "Brain functional connectivity analysis and crucial channel selection using channel-wise CNN", Proceedings of the 25th International Conference on Neural Information Processing (ICONIP), Part IV pp. 40-49, December 13-16, 2018, Siem Reap, Cambodia.

[43] Wu, Y., Xie, X., Bian, G., **Hou, Z.G.**, Cheng, X., Chen, S., Liu, S., Wang, Q., "Automatic guidewire tip segmentation in 2d x-ray fluoroscopy using convolution neural networks", Proceedings of the 2018 International Joint Conference on Neural Networks (IJCNN), pp. 1-7, July 8-13, 2018, Rio de Janeiro, Brazil.

[44] Peng, L., Wang, C., Luo, L., Chen, S., **Hou, Z.G.**, Wang, W., "A CPG-inspired assist-as-needed controller for an upper-limb rehabilitation robot", Proceedings of the 2018 IEEE Symposium Series on Computational Intelligence (SSCI), pp. 2200-2206, November 18-21, 2018, Bangalore, India.

[45] Prasong, P., Xie, X., **Hou, Z.G.**, "Guide-Wire Detecting Based on Speeded up Robust Features for Percutaneous Coronary Intervention", Proceedings of the 25th Interna- tional Conference on Neural Information Processing (ICONIP), Part IV pp. 405-415, December 13-16, 2018, Siem Reap, Cambodia.

[46] Luo, L., Peng, L., Wang, C., **Hou, Z.G.**, Wang, W., "An assist-as-needed controller for robotic rehabilitation therapy based on RBF network", Proceedings of the 2018 International Joint Conference on Neural Networks (IJCNN), pp. 1-7, July 8-13, 2018, Rio de Janeiro, Brazil.

[47] Luo, L., Peng, L., **Hou, Z.G.**, Wang, W., "An adaptive impedance controller for up- per limb rehabilitation based on estimation of patients' stiffness", Proceedings of the IEEE International Conference on Robotics and Biomimetics (ROBIO), pp. 532-537, December 5-8, 2017, Macau, China.

[48] Xu, Z., Wang, W., **Hou, Z.G.**, Lin, X., Liang, X., “Dynamic model based fuzzy-impedance interaction control for rehabilitation robots”, Proceedings of the IEEE International Conference on Robotics and Biomimetics (ROBIO), pp. 1583-1588, December 5-8, 2017, Macau, China.

[49] Peng, L., **Hou, Z.G.**, Peng, L., Luo, L., Wang, W., “Robot assisted upper limb rehabilitation training and clinical evaluation: Results of a pilot study”, Proceedings of the IEEE International Conference on Robotics and Biomimetics (ROBIO), pp. 2740- 2745, December 5-8, 2017, Macau, China.

[50] Wang, W., **Hou, Z.G.**, Liang, X., Ren, S., Peng, L., Luo, L., Cui, C. “Relative torque contribution based model simplification for robotic dynamics identification”, Proceed- ings of the 2017 IEEE Symposium Series on Computational Intelligence (SSCI), 1-7, November 27 - Dec. 1, 2017, Honolulu, HI, USA.

[51] Zhou, X., Bian, G., Xie, X., **Hou, Z.G.**, “An HMM-based recognition framework for endovascular manipulations”, Proceedings of the 39th Annual International Confer- ence of the IEEE Engineering in Medicine and Biology Society (EMBC 2017), pp. 3393-3396, July 11-15, 2017, Jeju Island, South Korea.

[52] Luo, L., Peng, L., **Hou, Z.G.**, Wang, W., “Design and control of a 3-DOF rehabilitation robot for forearm and wrist”, Proceedings of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2017), pp. 4127-4130, July 11-15, 2017, Jeju Island, South Korea.

[53] An, N., Sun, S., Zhao, X., **Hou, Z.G.**, “Online context-based person re-identification and biometric-based action recognition for service robots”, Proceedings of the 29th Chinese Control and Decision Conference (CCDC 2017), pp. 3369-3374, 2017.

[54] An, N., Sun, S., Zhao, X., **Hou, Z.G.**, “Move like humans: End-to-end Gaussian process regression based target tracking control for mobile robots”, Proceedings of Chinese Control Conference (CCC 2017), pp. 6917-6921, 2017.

[55] Zhou, X., Bian, G., Xie, X., **Hou, Z.G.**, Hao, J., “Prediction of natural guidewire rotation using an sEMG-based NARX neural network”, Proceedings of the International Joint Conference on Neural Networks (IJCNN2017), pp. 419-424, May 14-19, 2017, Anchorage, AK, USA.

[56] Wang, L., Xie, X., Bian, G., **Hou, Z.G.**, Cheng, X., Prasong, P., “Guide-wire detection using region proposal network for X-ray image-guided navigation”, Proceedings of the International Joint Conference on Neural Networks (IJCNN 2017), pp. 3169-3175, May 14-19, 2017, Anchorage, AK, USA.

[57] Liu, Q., Zhao, X., **Hou, Z.G.**, Liu, H., “Deep belief networks for eeg-based concealed information test”, Lecture Notes in Computer Science, 14th International Symposium on Neural Networks (ISNN 2017), vol. 10262, pp. 498-506, 2017.

[58] Xu, C., Li, S., Wang, K., **Hou, Z.G.**, Yu, N., “Quantitative assessment of paretic limb dexterity and interlimb coordination during bilateral arm rehabilitation training”, Proceedings of IEEE International Conference on Rehabilitation Robotics (ICORR 2017), pp. 634-639, July 17-20, 2017, London, UK.

[59] Cheng, X., Song, Q., Xie, X., Cheng, L., Wang, L., Bian, G., **Hou, Z.G.**, Huang, T., Prasong, P., “A fast and stable guidewire model for minimally invasive vascular surgery based on Lagrange multipliers”, Proceedings of 7th International Conference on Information Science and Technology (ICIST 2017), pp. 109-114, May 11, 2017.

[60] Peng, L.,**Hou, Z.G.**, Luo, L., Peng, L., Wang, W., Cheng, L., “An sEMG-driven neuromusculoskeletal model of upper limb for rehabilitation robot control”, Proceedings of the 2016 IEEE International Conference on Robotics and Biomimetics (ROBIO), Qingdao, China, pp. 1486-1491, 2016.

[61] Zhou, X., Bian, G., Xie, X., **Hou, Z.G.**, Hao, J., “Tracking natural guidewire manipulations with an improved data glove”, IEEE International Conference on Robotics and Biomimetics (ROBIO 2016), Qingdao, China, pp. 1832-1837, 2016.

[62] Zhou, X., Bian, G., Xie, X., **Hou, Z.G.**, Hao, J., “PCA-based muscle selection for interventional manipulation recognition”, IEEE International Conference on Robotics and Biomimetics (ROBIO 2016), Qingdao, China, pp. 921-926, 2016.

[63] Hao, J., Xie, X., Bian, G., Hou, **Hou, Z.G.**, Zhou, X., “Development of a multi-modal interactive system for Endoscopic Endonasal Approach surgery simulation”, Proceed- ings of the 2016 IEEE International Conference on Robotics and Biomimetics (RO- BIO), Qingdao, China, pp. 143-148.

[64] Wang, L., Li, D., Xie, X., Bian, G., **Hou, Z.G.**, “A vessel contour detection and estimation method for robot assisted endovascular surgery”, IEEE International Conference on Robotics and Biomimetics (ROBIO 2016), Qingdao, China, pp. 958-963, 2016.

[65] Liu, W., Cheng, L., **Hou, Z.G.**, and Tan, M., “An active disturbance rejection controller with hysteresis compensation for piezoelectric actuators”, Proceedings of the 12th World Congress on Intelligent Control and Automation (WCICA), 2016, Guilin, China, pp. 2148-2153.

[66] An, N., Zhao, X., **Hou, Z.G.**, “RGB-D tracking via detection-learning-segmentation”, Proceedings of 23rd International Conference on Pattern Recognition (ICPR 2016), pp 1231-1236, 2016.

[67] Hao, J., Bian, G., Xie, X., **Hou, Z.G.**, Zhou, X., “A 3-DOF compact haptic interface for endoscopic endonasal approach surgery simulation”, Proceedings of the IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM 2016), 2016, Banff, Alberta, Canada, pp. 136-141.

[68] Liu, W., Cheng, L., Zhou, C., Hou, **Hou, Z.G.**, Tan, M., “Neural-network based model predictive control for piezoelectric-actuated stick-slip micro-positioning devices”, Proceedings of the IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM 2016), 2016, pp. 1312-1317.

[69] L. Cheng, M. Cheng, H.-N. Yu, L. Deng, and **Hou, Z.G.**, ”Distributed tracking control of uncertain multiple manipulators under switching topologies using neural networks”, Proceedings of the International Symposium on Neural Networks (ISNN), Saint Petersburg, Russia, 2016, pp. 233-241.

[70] Wang, L., Xie, X., Gao, Z., Bian, G., **Hou, Z.G.**, “Guide-wire detecting using a modified cascade classifier in interventional radiology”, Proceedings of 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2016), pp. 1240-1243, October 13, 2016.

[71] Peng, L.**,Hou, Z.G.**, Peng, L., Wang, W., “Experimental study of robot-Assisted exercise training for knee rehabilitation based on a practical EMG-driven model”, Proceed- ings of the 6th IEEE RAS and EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob), pp. 810-814, July 26, 2016.

[72] L. Cheng, Y. Wang, **Hou, Z.G.**, and M. Tan, ”Convergence rate of leader-following consensus of networks of discrete-time linear agents in noisy environments,” Proceedings of the 35th Chinese Control Conference (CCC), Chengdu, China, 2016, pp. 8102-8107.

[73] Cui, C., Bian, G., **Hou, Z.G.**, Xie, X., Peng, L., and Zhang, D., “sEMG-based prediction of human lower extremity movements by using a dynamic recurrent neural net- work”, Proceedings of the 2016 Chinese Control and Decision Conference (CCDC), Yinchuan, China, 2016, pp. 5021-5026.

[74] Feng, Z., Bian, G., Xie, X., **Hou, Z.G.**, Hao, J., “Design and evaluation of a bio-inspired robotic hand for percutaneous coronary intervention”, Proceedings of IEEE International Conference on Robotics and Automation (ICRA 2015), 2015, June, pp. 5338-5343.

[75] Peng, L., **Hou, Z.G.**, Kasabov, N., Bian, G., Vladareanu, L., Yu, H., “Feasibility of NeuCube spiking neural network architecture for EMG pattern recognition”, Proceed- ings of the International Conference on Advanced Mechatronic Systems (ICAMechS), pp. 365-369, October 1, 2015.

[76] Melinte, O., Vladareanu, L., Munteanu, L., Yu, H., Cang, S., **Hou, Z.G.**, Bian, G., Wang, H., “Haptic intelligent interfaces for NAO robot hand control”, Proceedings of the International Conference on Advanced Mechatronic Systems (ICAMechS), pp. 50-55, 2015.

[77] Peng, L., **Hou, Z.G.**, Peng, L., Hu, J., Wang, W., “An sEMG-driven musculoskele- tal model of shoulder and elbow based on neural networks”, Proceedings of the 7th International Conference on Advanced Computational Intelligence (ICACI 2015), pp. 366-371, August 10, 2015.

[78] Liu, Q., Zhao, X., **Hou, Z.G.**, Liu, H., “Multi-scale wavelet kernel extreme learning machine for EEG feature classification”, Proceedings of the IEEE International Conference on Cyber Technology in Automation, Control and Intelligent Systems (IEEE-CYBER), 2015, pp. 1546-1551.

[79] Yang, F., **Hou, Z.G.**, Mi, S., Bian, G., Xie, X., “Centerlines extraction for lumen model of human vasculature for computer-aided simulation of intravascular procedures”, Proceedings of the 11th World Congress on Intelligent Control and Automation (WCICA), pp. 970-975, March 2, 2015.

[80] Wei, P., Feng, Z., Xie, X., Bian, G., **Hou, Z.G.**, “FEM-based guide wire simulation and interaction for a minimally invasive vascular surgery training system”, Proceedings of the World Congress on Intelligent Control and Automation (WCICA), pp. 964-969, March 2, 2015.

[81] Peng, L., **Hou, Z.G.**, Wang, W., “A dynamic EMG-torque model of elbow based on neural networks”, Proceedings of the 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2015), pp. 2852-2855, 2015.

[82] Peng, L., **Hou, Z.G.**, Peng, L., Wang, W., “Design of CASIA-ARM: A novel rehabilitation robot for upper limbs”, Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), pp. 5611-5616, Hamburg, 2015.

[83] Peng, L., **Hou, Z.G.**, Peng, L., Wang, W., “A practical EMG-driven musculoskeletal model for dynamic torque estimation of knee joint”, Proceedings of the IEEE Interna- tional Conference on Robotics and Biomimetics (ROBIO 2015), pp. 1036-1040, 2015.

[84] Cui, C., Bian, G., **Hou, Z.G.**, Tan, M., Zhang, D., Xie, X., Wang, W., “An RBF-based neuro-adaptive control scheme to drive a lower limb rehabilitation robot”, Proceedings of the IEEE International Conference on Robotics and Biomimetics (ROBIO 2015), pp. 397-402, 2015.

[85] Hao, J., Bian, G, Xie, X., **Hou, Z.G.**, Yu, H., “Kinematic and static analysis of a cable-driven 3-DOF delta parallel mechanism for haptic manipulators”, Proceedings of the 34th Chinese Control Conference (CCC 2015) pp. 4373-4378, 2015.

[86] Wang, Y., Cheng, L., Wang, H.,**Hou, Z.G.**, Tan, M., Yu, H., “Leader-following consensus of discrete-time linear multi-agent systems with communication noises”, Proceedings of the 34th Chinese Control Conference (CCC 2015), 2015, pp. 7010-7015.

[87] Wang, Y., Cheng, L., **Hou, Z.G.**, Tan, M., Yu, H., “Coordinated transportation of a group of unmanned ground vehicles”, Proceedings of the 34th Chinese Control Conference, CCC 2015, pp. 7027-7032, 2015.

[88] Liu, W., Cheng, L., Wang, H., **Hou, Z.G.**, Tan, M., “An inversion-free fuzzy predictive control for piezoelectric actuators”, Proceedings of the 2015 27th Chinese Control and Decision Conference, CCDC 2015, p.p 953-958, 2015.

Professional Society Membership

Academic Society Membership:

– Fellow, IEEE, 2019 - Present.

– Fellow, CAA, 2020 - Present.

– VP, Chinese Association of Automation (CAA), 2019 - Present.

– VP, Asia Pacific Neural Network Society (APNNS), 2019 - Present.

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