

# Brief CV of Zeng-Guang Hou

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## Education

- Ph.D. (Beijing Inst. Tech., 1997), M.S. (Yanshan U., 1993), B.S. (Yanshan U., 1991), in EE.

## Work Experience

- Professor, June 2004 - present, Institute of Automation, Chinese Academy of Sciences (CAS).
- Professor, Dec. 2016 - present, Center for Excellence in Brain Science and Intelligence Technology, CAS.
- Distinguished Professor, Oct. 2012 - present, School of Artificial Intelligence, University of CAS.
- Visiting Professor, 2003-2004, Intelligent Systems Lab, College of Engineering, Univ. of Saskatchewan, Canada.
- Associate Professor, July 1999 - May 2004, Institute of Automation, CAS.

## Professional Activities, Leadership & Services

- Vice-President, Asia Pacific Neural Network Society (APNNS), 2020-now.
- Vice-President, Chinese Association of Automation (CAA), 2018-now.
- BOG member, International Neural Network Society (INNS), 2017-2022.
- Technical Chair, International Joint Conference on Neural Networks (IJCNN), Yokohama, Japan, June 30 - July 5, 2024.
- Tutorial Chair, International Joint Conference on Neural Networks (IJCNN), Gold Coast, Queensland, Australia, June 18-23, 2023.
- PC Chair, International Joint Conference on Neural Networks (IJCNN), Shenzhen, China, July 18-22, 2021.
- PC Chair, IEEE Symposium Series on Computational Intelligence (SSCI), Xiamen, December 6-9, 2019.
- PC Chair, 10th International Conference on Advanced Computational Intelligence (ICACI), Xiamen, March, 29-31, 2018.
- Organization Chair, IEEE World Congress on Computational Intelligence (WCCI), Beijing, China, July 6-11, 2014.
- Chair, Adaptive Dynamic Programming and Reinforcement Learning Technical Committee (ADPRL TC), IEEE CIS, 2017.1-2018.12
- Chair, Neural Networks Technical Committee (NNTC), IEEE CIS, 2015.1-2016.12.
- Editor, IEEE CIS E-letter, 2011.1-2012.12.
- AE, *Neural Networks*, 2013-now.
- AE, *IEEE Transactions on Cybernetics*, 2014-now.
- AE, *IEEE Systems, Man, and Cybernetics Magazine*, 2021-now.
- AE, *IEEE/CAA Journal of Automatica Sinica*, 2021-now.
- AE, *IEEE Transactions on Neural Networks*, 2008-2011.
- AE, *IEEE Computational Intelligence Magazine*, 2006-2007.
- AE, *Journal of Intelligent and Fuzzy Systems*, 2006-2014.

## Awards & Fellowship

- Fellow, IEEE, 2019; CAA, 2020.
- “Dennis Gabor Award”, INNS, 2023.
- “Best Paper Award”, Neural Networks, INNS, 2022.
- “Gold Medal”, The International Exhibition of Inventions of Geneva, 2021.
- “Outstanding Achievement Award”, Asia Pacific Neural Network Society (APNNS), 2017.
- “State Natural Science Awards” (Second-class prize), Chinese Central Government, 2017.
- “Best Paper Award”, *Neural Networks*, INNS, 2016.
- “Outstanding Paper Award”, *IEEE Transactions on Neural Networks*, IEEE CIS, 2013.
- “Best Paper Award”, IEEE International Conference on Information and Automation (ICIA), 2013.
- “Natural Science Award” (First-class prize), Chinese Association of Automation, 2015.
- “Distinguished Young Scholar Award”, National Natural Science Foundation of China (NSFC), 2012.

## Research Impact & Innovation Funding

- He has published 200+ journal papers which attracted 12,000+ citations (H-index 56).
- He has been invited and delivered 30+ keynote/plenary talks at conferences.
- His research invention was granted 40+ patents and awarded 20+ research grants (PI or co-PI).

## Publications (some of recent publications)

- [1] Wang, J., Shi, L., Wang, W., Hou, Z.G., “Efficient brain decoding based on adaptive EEG channel selection and transformation”, *IEEE Trans on Emerging Topics in Computational Intelligence*, 2022, vol.6, pp. 1314-1323.
- [2] Wang C., Peng L., Hou, Z.G., et al., “A Hierarchical architecture for multisymptom assessment of early Parkinson’s disease via wearable sensors”, *IEEE Trans on Cognitive and Developmental Systems*, 2022, 14(4), pp. 1553-1563.
- [3] Fan, C., Peng, L., Wang, T., Yang, Zhou, X., Hou, Z.G., “R-GAN: Multi-session future MRI prediction with temporal recurrent generative adversarial network”, *IEEE Trans on Medical Imaging*, 2022, 41(8), pp. 1925-1937.
- [4] Ni, Z., Bian, G, 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*, 2022, 26(7), pp. 3209-3217.
- [5] Zhou, X., Xie, X., Liu, S., Feng, Z., Hou, Z.G., “Surgical skill assessment based on dynamic warping manipulations”, *IEEE Trans on Medical Robotics and Bionics*, vol. 4, no. 1, pp.50-61, Feb. 2022.
- [6] Li, R., Xie, X., Zhou, X., Liu, S., Ni, Z., Hou, Z.G., “A unified framework for multi-guidewire endpoint localization in fluoroscopy images,” *IEEE Transactions on Biomedical Engineering*, vol. 69, no. 4, pp. 1406-1416, April 2022.
- [7] Gui, M., Zhou, X., Xie, X., Liu, S., Li, H., Hou, Z.G., “Design and experiments of a novel Halbach-cylinder-based magnetic skin: a preliminary study”, *IEEE Trans on Instrumentation and Measurement*, 2022, vol. 71, pp. 1-11.
- [8] Wang, J., Wang, W., Ren, S., Shi, W., Hou, Z.G., “Neural correlates of single-task versus cognitive-motor dual-task training”, *IEEE Transactions on Cognitive and Developmental Systems*, vol. 14, no. 2, pp. 532-540, June 2022.
- [9] Wang, G., Hu, Q., Yang, Y., Cheng, J., Hou, Z.G., “Adversarial binary mutual learning for semi-supervised deep hashing”, *IEEE Trans on Neural Networks and Learning Systems*, August 2022, vol. 33, no. 8, pp. 4110-4124.
- [10] Wang, C., Peng, L., Hou, Z.G., et al, “The assessment of upper-limb spasticity using a portable measurement system”, *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, vol. 29, pp. 2242-2251, 2021.
- [11] Li, R, Xie, X., Zhou, X., Liu, S., Ni, Z., Zhou, Y., Hou, Z.G., “Real-time multi-guidewire endpoint localization in fluoroscopy images”, *IEEE Transactions on Medical Imaging*, vol. 40, no. 8, pp. 2002-2014, 2021.
- [12] 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.
- [13] Wang, W., Shi, W., Hou, Z.G., et al, “Prediction of human voluntary torques based on collaborative neuromusculo-skeletal modeling and adaptive learning”, *IEEE Transactions on Industrial Electronics*, 2021, vol. 68, pp. 5217-5226.
- [14] Wang, S., Wang, K., Tang, R., 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*, 2021, vol. 3, pp. 289-293.
- [15] Fan, C., Yang, H., Hou, Z.G., et al, “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.
- [16] Wang, G., Yang, Y., Zhang, T., Hou, Z.G., et al, “Cross-modality paired-images generation and augmentation for RGB-infrared person re-identification”, *Neural Networks*, 2020, vol. 128, pp. 294-304. “Best Paper Award”.
- [17] 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 Neurobotics*, November 12, 2020, vol. 14, 596019.
- [18] Wang, J., Wang, W., and Hou, Z.G., “Towards improving engagement in neural rehabilitation: Attention enhancement based on BCI”, *IEEE Trans on Cognitive and Developmental Systems*, 2020, vol. 12, pp. 787-796.
- [19] Wang, A., Cheng, L., Yang, C., Hou, Z.G., “An adaptive fuzzy predictive controller with hysteresis compensation for piezoelectric actuators”, *Cognitive Computation*, July 2020, vol. 12, no. 4, pp. 736-747.
- [20] Ren, S., Wang, W., Hou, Z.G., et al, “Enhanced motor imagery based brain-computer interface via FES and VR for lower limbs”, *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 2020, vol.28, pp. 1846-1855.
- [21] Wang, C., Peng, L., Hou, Z.G., et al, “Quantitative assessment of motor function for post-stroke rehabilitation based on motor synergy analysis”, *IEEE Trans on Neural Systems and Rehabilitation Engineering*, 2020, v.28, pp. 943-952.
- [22] Sun, T., Peng, L., Cheng, L., Hou, Z.G., “Composite learning enhanced robot impedance control”, *IEEE Transactions on Neural Networks and Learning Systems*, vol. 31, no. 3, pp. 1052-1059, March 2020.
- [23] 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.
- [24] Zhang, F., 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.
- [25] Wang, W., Hou, Z.G., et al., “Toward patients’ motion intention recognition: dynamics modeling and identification of iLeg”, *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, vol. 46, no. 7, pp. 980-992, 2016.

## Patents (some of granted patents)

- [1] PCT/US Patent: “Multi-posture lower limb rehabilitation robot”, No.: US10722416B2, Date of Patent: 2020.07.28.
- [2] PCT/US Patent: “Method and system for predicting outcomes based on spatio/spectro-temporal data”, No.: US10579925B2, Date of Patent: 2020.3.3.
- [3] PCT/US Patent: “Upper limb rehabilitation robot system”, No.: US10596056B2, Date of Patent: 2020.03.24.
- [4] PCT/US Patent: “System of functional electrical stimulation”, No.: US8983621B2, Date of Patent: 2015.03.17.
- [5] PCT/US Patent: “Catheter manipulating device for vascular intervention”, No.: US10252029B2, Date: 2019.4.09
- [6] CN Patent: “A BCI based attention-regulation system”, No.: CN107397648B, Date of Patent: 2019.07.12.
- [7] CN Patent: “A hand rehabilitation device and system”, No.: CN107397648B, Date of Patent: 2019.07.12.
- [8] CN Patent: “An active training control method for rehabilitation robots”, No.: CN105771182B, Date: 2018.06.29.
- [9] CN Patent: “Rehabilitation training method based on impedance control”, No.: CN104644378B, Date: 2017.06.13.
- [10] CN Patent: “Fingers and wrist rehabilitation training device”, No.:CN105796285B, Patent Date: 2017.11.21.
- [11] CN Patent: “sEMG-based active training control for rehabilitation robots”, No.:CN104492033B, Date: 2017.7.21.