

Hao Tan

Curriculum Vitae

School of Computing
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Research Interests

theme: Deep Learning
Image Classification
Neural Architecture Search

auxiliary: Swarm Intelligence

Education

2021 – future **Doctor of Philosophy**, *School of Computing*, University of Leeds, UK.

Supervisor: Dr Mohammad Nabi Omidvar, Professor Netta Cohen

Joint Ph.D. program, *Department of Computer Science and Engineering*, Southern University of Science and Technology, China.

Undergraduate Thesis: Neural Architecture Search Based on Differential Evolution.

Working Experiences

2020 – 2021 **Research Assistant**, *Department of Computer Science and Engineering*, Southern University of Science and Technology, China.

Research Grants:

- 2020-2022: Evolutionary Computation Based Deep Neural Architecture Search for Microchips, **Key Member**, RMB 1,280,000, Huawei Hisilicon, China.
- 2020-2023: Cell-Based Deep Neural Networks Architecture Search Using Evolutionary Multiobjective Optimization, **Key Member**, RMB 230,000, National Science Foundation, China.

Publications and Patents

Refereed Journal Articles

- TNNLS **Hao Tan**, Ran Cheng, Shihua Huang, Cheng He, Changxiao Qiu, Fan Yang, Ping Luo. Relative-NAS: Relative Neural Architecture Search via Slow-Fast Learning. *IEEE Transactions on Neural Networks and Learning Systems*, 2021 (early access). (SCI IF=10.451)
- Proposed RelativeNAS method using slow-fast learning, which performed joint learning between fast-learners and slow-learners in a pairwise manner.
 - Proposed a continuous encoding scheme for cell-based search space by considering connections between pairwise nodes and the corresponding operations.
 - Adopted a weight set as a knowledge base to estimate the performances when comparing the architectures in each pair, as well as a gathering of the promising knowledge in the population.
 - Spent only nine hours with a single 1080Ti GPU to obtain the discovered cells and achieved state-of-the-art results on image classification tasks.
 - The discovered cells obtained on CIFAR-10 being directly transferred to object detection, semantic segmentation, and keypoint detection, which still yielded competitive results.

SWEVO Cheng He, **Hao Tan**, Shihua Huang, Ran Cheng. Efficient Evolutionary Neural Architecture Search by Modular Inheritable Crossover. Swarm and Evolutionary Computation, 2021 (in press). (SCI IF=7.177)

Conference Proceedings

BIC-TA 2019 **Hao Tan**, Cheng He, Dexuan Tang, Ran Cheng. Efficient Evolutionary Neural Architecture Search by Modular Inheritable Crossover. International Conference on Bio-inspired Computing: Theories and Applications, Zhengzhou, China, November 2019.

- Proposed an efficient evolutionary NAS method using a tailored crossover operator, which enabled the offspring network to inherit promising modular from their parent networks.
- Conducted experiments with the results on CIFAR-10 in comparison with state-of-the-art NAS methods, and validated the effectiveness of our proposed modular inheritable crossover operator.

Patents

Ran Cheng, **Hao Tan**, Cheng He, Zhanglu Hou, Changxiao Qiu. A Neural Architecture Search Method and System based on Evolutionary Learning. International Patent, PCT/CN2020/136950, filed Jan. 4, 2021.

Professional Services

Reviewer of Journals

IEEE Access

Applied Soft Computing

Complex & Intelligent Systems

Awards

2019 **Best Paper Award** of 14th International Conference on Bio-inspired Computing: Theories and Applications (BIC-TA 2019), Zhengzhou, China.

Computer skills

Programming: Python, JAVA, MATLAB, Shell

OS: MacOS, Microsoft Windows, Linux

Scientific: PyTorch, MATLAB

Typography: L^AT_EX, Microsoft Office

Languages

Mandarin **Mothertongue**

English **Intermediate**

IELTS: Overall: 6.5, Listening: 6.0, Reading: 7.5, Writing: 6.0, Speaking: 6.0