CORE COMPETENCIES

- Multimodal AI & LLMs (Transformers, Mamba, MoE)
- Technology Roadmapping & Strategy
- Large-scale GPU / HPC Infrastructure
- Edge & Mobile AI Deployment
- 5G/6G, Photonics, Quantum Supercomputing
- R&D Leadership & Stakeholder Engagement

CONTACT DETAILS
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LANGUAGES
English (Fluent)
Mandarin (Fluent)

SUMMARY
Regional head of Huawei's Central Research Institute (Singapore) with 15+ years' experience delivering cutting-edge AI and ICT solution. Currently spearheading Huawei's company-wide **multimodal AI technology roadmap and R&D**, orchestrating cross-functional teams to translate research breakthroughs into scalable products across cloud, edge, and device ecosystems. Built and lead a 40-member team, rolled out a large-scale GPU cluster of LLM training platform that achieves 10x speed-up over state-of-the-art, secured > USD 10M external funding and filed 10+ patents.

EDUCATION
2011
Ph. D (Electrical and Electronic Engineering)
Nanyang Technological University, SG

2007
Master (Optical Communications)
Huazhong University of Sci & Tech, CN

2004
Bachelor (Optical Communications)
Huazhong University of Sci & Tech, CN

CERTIFICATE/MEMBERSHIP
IEEE Senior Member
OSA Senior Member
AAAI Member
Coursera Machine Learning
Coursera Deep Learning Specialist
IXIA BPS Specialist

Dr. HUANG Qirui

PROFESSIONAL EXPERIENCE

Huawei Technologies — Sept. 2018 – Present

***Head**, Singapore Region, Central Research Institute*

- Drive Huawei's **multimodal AI technology** roadmap and lead end-to-end R&D programmes, aligning research with next-generation product requirements;
- Direct research on large computing clusters for **LLM training & inference**;
- Pioneer novel AI models for **Edge/Mobile computing**, including on-device generative AI;
- Formulate mid-and long-term technology strategy and investment portfolios (AI, HPC, 6G);
- Charter and execute emerging-technology PoCs and cultivate collaborations with academia and industry thought leaders.

Key Achievements:

- **Led team to Develop LLM training/Inference engine for Huawei's Pangu LLMs** (achieving **10x speedup** compared to Microsoft's DeepSpeed)
- **Led research in Development of AI-based Active Noise Control algorithms for Smart Vehicle and Earbuds** (published in top IEEE venues)
- **Delivered 10+ partner projects (> USD 10M) in AI, HMI, 6G Comm etc**.
- Fielded **14 patents** in AI, Smart Phones, Wearable Applications, LiDAR, and Wireless Energy Transfer.

Singapore University of Tech. & Design — July 2015 – Sept. 2018

***Senior Specialist**, Network Security & AI*

Research on Network Security and Artificial Intelligence; In charge of design, documentation and implementation of Research Testbed, Hybrid Cloud infrastructure, and SUTD AI Lab; Lead technical innovations, system administrations, facility training, hardware configuration, and software development; Deliver presentations and demos to funding sponsors; drive international collaborations.

Key Achievements:

- Delivered MINDEF sponsored research project (SGD 4.677M)
- Built up research testbed (Tens of Racks) and hybrid Cloud Infrastructure (Thousands of VMs) for defense research in state-of-the-art solutions and approaches against network attacks and intrusions;
- Published 1 journal paper, 1 book chapter and 1 invited talk.

Project: Cross-functional Information System for Decision Making (CISDeM)

- Manage research funds, lead technical directions and R&D team (7 tracks with 8 research fellows, 12 research assistants);
- Design and implement ***New Generation Security Operation Center (SOC) Framework*** utilizing Big-Data, IDS, SDN, NFV and Machine Learning;
- Establish research collaboration with industry and prestigious universities.

Institute for Infocomm Research, A*STAR — Feb 2011 – June 2015

***Scientist**, Data Center Networks & SDN Technologies*

Research on Optical Switching Technique for large-scale data center and supercomputer, software-defined network (SDN), network function virtualization (NFV); Lead actively in network architecture design and software development; Deliver presentations and user cases training for industry partner.

Key Achievements:

- Delivered 3 projects to meet industry and research goals;
- Built up photonic switch prototype for large-scale datacenter;
- Published 10 peer-reviewed papers and 1 patent.

Project: Load-Balancing Value-Added Services Platform for SDN-enabled Switches

- Design and develop load-balancing value-added services platform including OpenStack, SDN-enabled switch and OpenFlow applications;
- Integration of white-box switch with SDN controllers including OpenDaylight, Floodlight, HP SDNC, VMWare ESXi, vSphere, NSX and OpenStack;
- Development of Restful APIs and logic modules for value-added services such as load balancer, firewall, network recovery, virtual network service provider, etc.

Project: Development of High Port Count Optical Switch Prototype for Datacenter and Supercomputers

- Designed SDN-enabled architecture of high port count optical switch;
- Led development of key components for high-speed data switching;
- Designed traffic control algorithms to reduce power consumption for large-scale data centers;
- System implementation and prototype demonstration.

Project: A 1024 x 1024 Optical Crossconnect for Terabit/s Routers and Supercomputers

- FPGA development of fast tunable laser linecard for optical-switched networks;
- Designed and analyzed hybrid Ethernet and optics-fiber networks in data centers;
- Conducted network performance analysis and traffic aggregation;
- Prototyped photonic load-balanced switching system.

Nanyang Technological University **Jan 2007 – Jan 2011**

***Ph.D Researcher**, Fiber-Optics Networks*

Responsible for architecture design and study of IP/MPLS optical transport network; Design and implementation of Reconfigurable Optical Add-Drop Multiplexer for optical transport network; Performance investigation of optical transport network.

Key Achievements:

- Delivered 2 projects to meet R&D goals;
- Published 17 peer-reviewed journal and conference papers.

Project: Multicast-capable Packet Switching Systems for Optical IP/MPLS Networks

- Designed and investigated multicast-capable optical switch to reduce the cost and complexity of IP/MPLS networks;
- Designed the scheduling algorithm to minimize packet loss and latency performance;
- Developed an open-source simulator of optical packet switching using C++.

Project: Bidirectional Reconfigurable Optical Add-Drop Multiplexer (ROADM)

- Designed architecture of bidirectional ROADM;
- Developed control module by Altera FPGA;
- Conducted performance testing.

KNOWLEDGE AND SKILLS

- Solid skills in Strategy, Business Development, and Project Management.
- 10+ years' project experiences in Artificial Intelligence, network security, optical transport network, Data Center network design and management, Fiber Channel switch, high-speed linecard, fast-tunable optical transceiver.
- In-depth knowledge of network technologies such as OpenFlow/SDN, IP/MPLS, InfiniBand, Ethernet, SAN, NAS, DWDM, EPON, GPON, TCP/IP, BGP, OSFP.
- Expert understanding of fiber-optic networks, Layer 2/3 switching/routing technologies, VxLAN, Load-Balancing, OpenStack, Various Network Performance Measurement, QoS control.
- Expert understanding of machine learning, deep learning, real-world APT tools, Malware, Botnet, Firewall, Sandbox, Machine Learning, Big Data, NFV, Cloud Computing and VMWare.
- Hands-on experience in IXIA Breaking Point System, VMWare ESXi, NSX, and vSphere, switch/router equipment operation, including Cisco, HPE, Brocade, Mikrotik, Ubiquiti Networks, Mellanox, EdgeCore, Pica8, OpenvSwitch.
- Proficient in programming with C/C++, JAVA, Python, MATLAB, Perl, Visual Basic.

PUBLICATIONS

50+ publications in peer-review journals, conferences, patents and book chapter.

ADDITIONAL INFORMATION

Awards/Honors

- Workshop Organization Award, Huawei Technologies **2024**
- Quality Star, Huawei Technologies **2023**
- Outstanding Grass-roots Organization Award, Huawei Technologies **2022**
- Outstanding Technology Strategy Development Award, Huawei Technologies **2021**
- President Award for Best Technology Innovation, Huawei Technologies **2020**
- Future Star, Huawei Technologies **2019**
- President Award for Best Organization Building, Huawei Technologies **2019**
- Best Paper Award of IEEE International Conference on Communications (ICC 2012) **2012**
- Outstanding Award of 6th "Chunhui" Cup International Business Plan Competition **2011**
- Chinese Government Award for Outstanding Self-Financed Students Abroad **2010**
- Nanyang Technological University Research Scholarship **2007 - 2010**
- Third Award of IEEE Singapore Section Research Paper Contest **2007**
- Academic Research Paper Award, Huazhong Univ. of Sci. and Tech., **2006**

Interests

Badminton, tennis, travel, photography, community involvement in various activities