

INTERVIEW WITH PROF. LU ZHIHUI, FUDAN UNIVERSITY CHINA

Editor: Yafei Hou



Prof. Lu Zhihui

Zhihui Lu is a Professor at School of Computer Science, Fudan University. He received Ph. D from Fudan University in 2004, and he is a member of the IEEE and China computer federation's service computing specialized committee. His research interests are cloud computing and service computing technology, big data architecture, mobile edge computing, and IoT distributed system.

What are the major missions and main research topics of your team?

Cloud Computing, Distributed/Parallel Computing, and Mobile Edge Computing.

You have got a lot of research funds from both industrial also government. Could you briefly introduce your projects and which has been the most

challenging so far?

For projects, I have not only hosted some funds supported by government, but also hosted some projects from the industrial companies. These projects include National Key Research and Development Programs, National Natural Science Foundations and Shanghai Science and Technology Innovation Action Plan Projects, and Enterprise cooperation project. I think the most challenging project is our current National Natural Science Foundation "The research of collaborative processing technology of intelligent tasks in edge-cloud orchestrated architecture".

The hybrid architecture of edge and cloud computing provides important support for edge intelligent task processing, and can process the highly dispersed massive data generated by terminal devices at the edge. However, there are still some problems to be solved. For example, the mismatch between resource-intensive intelligent model and resource-limited devices, the low efficiency of model collaborative scheduling strategy in a heterogeneous environment, and the lack of security and reliability of edge nodes and end devices. Aiming at these problems, this project will firstly help to improve the development of collaborative processing technology of data intelligent tasks under edge-cloud orchestrated architecture. Secondly, key algorithms and models support for the effective utilization of resources, efficient scheduling of models, and reliable guarantee of data storage in the edge-cloud collaborative environment will be provided. Finally, theoretical foundations and valuable practical explorations for the industrial application of edge computing will be consolidated, facilitating the application of basic research.

What are the main research directions of wireless service and cloud computing technologies for the next decade from the your view?

I think the main research directions of wireless service and cloud computing technologies for the next decade are mobile edge computing, edge-AI and Cloud-Edge resource collaborative scheduling etc.

The technologies of AI and IoT are definitely driving forces for future wireless system. In your opinion, how do you think these technologies will change the

research directions of wireless service and cloud computing technologies and smart device of consumer electronics?

I think the technologies of AI and IoT can be considered as a complementary package towards the research directions of wireless service and cloud computing technologies and smart device of consumer electronics. From this perspective, it is essential to understand the role of these significant components that will provide a comprehensive vision for the worldwide smart city project in the near future. It is also essential to consider the emerging technologies-based intelligent applications for better lifestyle and more optimized solutions in our daily life.

In your opinion, which research topics are more important or practical for the wireless network systems in next decade?

I think the following research topics are more important or practical for the wireless network systems:

1. Develop a scheduling technique when users are dynamic
2. Develop a conflict-free scheduling algorithm which runs on the base station for which the tasks will be assigned from mobile user to a particular sensor node
3. Using data filtering or data compression method, unwanted sensory data can be minimized.

Could you provide some comments on the integration of wireless applications or high-performance content delivery in large-scale smart devices or consumer electronic equipment for Society 5.0?

For the integration of wireless applications or high-performance content delivery, we mainly focus on the intelligence edge computing. In large-scale smart devices or consumer electronic equipment for Society 5.0, Intelligence Edge Computing (IEC) is the key enabler of emerging 5G technologies networks and beyond. IEC is considered to be a promising backbone of future services and wireless communication systems in 5G integration. In addition, IEC enables various use cases and applications, including autonomous vehicles, augmented and virtual reality, big data analytic, and other customer-oriented services. Moreover, it is one of the 5G technologies that most enhanced market drivers in different fields such as customer service, healthcare, education methods, IoT in agriculture and energy sustainability.

How do you think the integration of your research results on the consumer electronic systems?

Our research results involve cloud-edge hybrid architecture, edge AI, etc. We believe these technologies can be combined with the consumer electronic systems to promote the development of the industry.

Do you have some messages of encouragement to young researchers potentially interested in your research field?

From the beginning of your research, the choices you make in what you pursue will have a major impact on when you can begin your research work. You will need to balance your passion for an area or particular project with a realistic appraisal of how long the project will take to complete. Nevertheless, science is more of a calling than simply a job, and it is your passion for the work that will sustain you throughout your life. For my research field (i.e. distributed computing, edge computing etc.), there will be many challenges and opportunities to promote the development of the industry and change the definition of the world. Hence, try to do it, young man.