上海科技大学
ShanghaiTech University

SIST NEWSLETTER

ISSUE No. 14, October 2020

School of Information Science and Technology

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SIST Website

PDF Newsletters

School of Information Science and Technology (SIST)
School Website: http://sist.shanghaitech.edu.cn/sist_en/

SIST News

1

July 25th

July 25th, SIST held the graduation ceremony for 235 graduate students, including 162 bachelor students, 62 master students and 11 Ph.D. On that day, graduates were awarded their diploma, which marks the beginning of their new journey.

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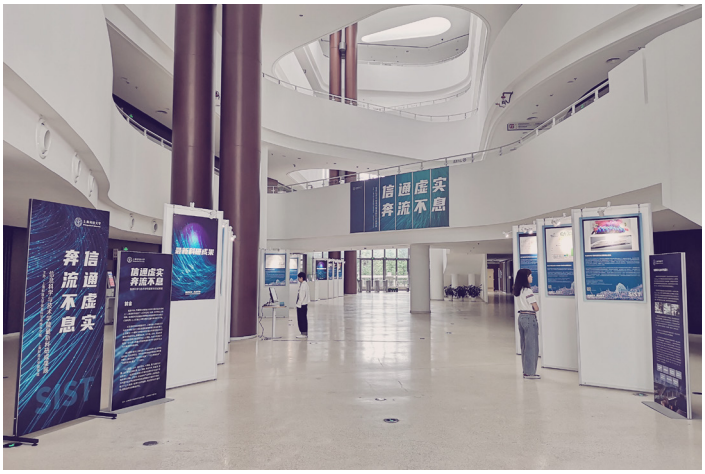

August 10th

August 10th, SIST and the Library and IT Services launched the SIST academic exhibition. Dozens of SIST academic posters, awards, trophies, and demo videos were exhibited in the lobby of the ShanghaiTech library to display latest academic achievements of SIST.

3

September 4th

September 4th, the SIST opening ceremony was held in the lecture hall of ShanghaiTech University. 607 freshmen attended the ceremony. Among them, 78 students will be jointly supervised by famous companies and SIST through the newly established industrial master program.

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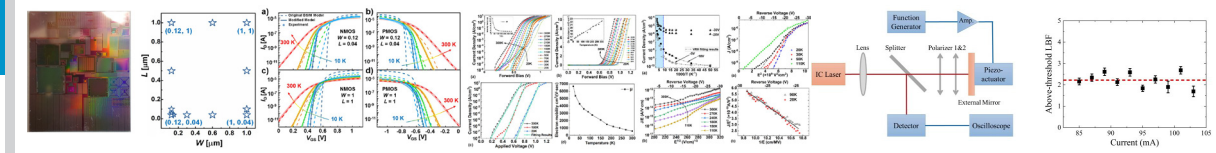
NEWSLETTER

Research Discoveries

The ShanghaiTech Microelectronics Center and the Post-Moore Microelectronics and Integrated Circuit Center (PMICC) at SIST have published results on major progress on novel cryo-CMOS and optoelectronics devices:

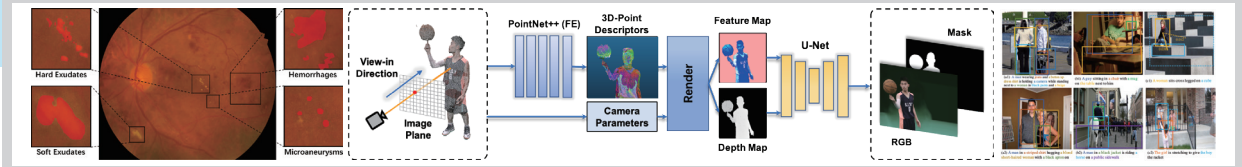
1. In collaboration with Dr. Hu Shaojian's team at the Shanghai IC R&D Center (ICRD), Prof. Kou Xufeng's group performed experimental characterizations and device modeling on the nanoscale MOSFETs with HLMC 40 nm low-power CMOS technology.
2. Prof. Zou Xinbo's group proposed the modified thermionic emission diffusion (TED) mode, starting from the physical formula of conventional TED model.
3. Prof. Wang Cheng's group first proposed a rate equation model for mid-infrared interband cascade lasers (ICLs) since its invention in 1997, which is a very universal and powerful theoretical tool for studying the physics of lasers.

Link: https://sist.shanghaitech.edu.cn/sist_en/2020/0409/c3863a51032/page.htm



Since the beginning of 2020, a total of 29 academic papers from the Visual & Data Intelligence (VDI) Center of SIST have been accepted by top-tier international conferences, covering research hotspots including computer vision, machine learning, natural language processing, computer graphics, and multi-agent systems. Those research outcomes address a variety of real-world problems in digital entertainment, architectural design, traffic monitoring and control, medical imaging, and the digital economy.

Link: https://sist.shanghaitech.edu.cn/sist_en/2020/0615/c3863a53128/page.htm

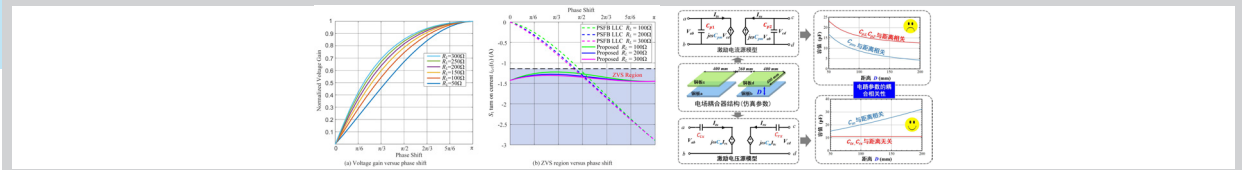


Prof. Yu Jingyi's Group has published a top journal paper, "Neural Opacity Point Cloud", in IEEE Transactions on Pattern Analysis and Machine Intelligence (IEEE TPAMI). This work introduces a neural renderer which can render complex scenes and generate images at an arbitrary viewpoint.

Link: https://sist.shanghaitech.edu.cn/sist_en/2020/1014/c3863a56300/page.htm

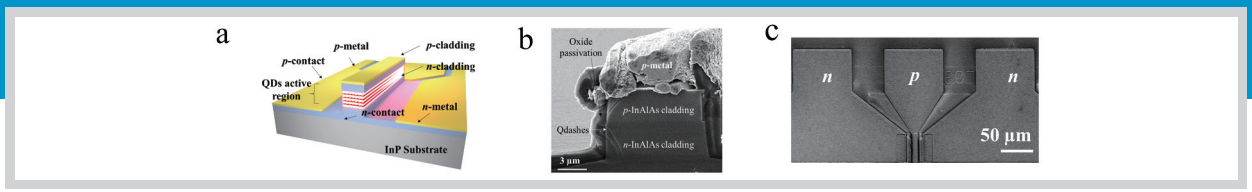
Both Prof. Wang Haoyu and Prof. Fu Minfan published technical papers in IEEE Transactions on Power Electronics. These two paper focus on "how to achieve efficient vehicle charging with an ultra-wide output voltage range" and "how to optimize the circuit model of electric field coupling wireless power systems".

Link: https://sist.shanghaitech.edu.cn/sist_en/2020/1010/c3863a56229/page.htm



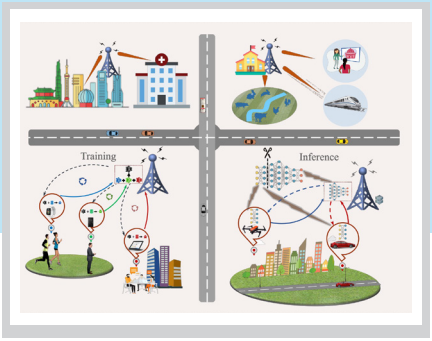
Professor Chen Baile's research group from the Post-Moore Devices Microelectronics and Integrated Circuit Center collaborated with other universities and achieved significant breakthroughs in O-band silicon-based quantum dot avalanche photodiodes, C-band indium phosphide-based quantum-dash detectors, and mid-infrared high-speed detectors.

Link: https://sist.shanghaitech.edu.cn/sist_en/2020/1010/c3863a56228/page.htm

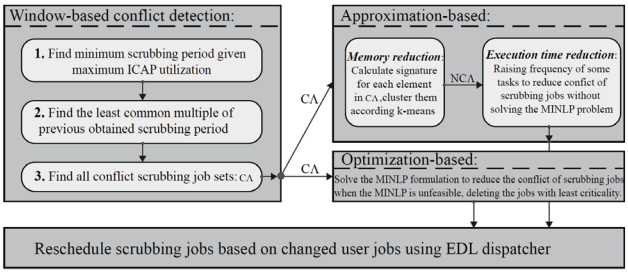


Prof. Shi Yuanming's research group and collaborators from HKUST and HKPolyU have surveyed the key techniques for improving the communication efficiency of performing artificial intelligence (AI) training and inference tasks at network edges. The exciting results have recently been published in IEEE Communications Surveys and Tutorials, entitled "Communication-Efficient Edge AI: Algorithms and Systems" by Shi et al.

Link: *https://sist.shanghaitech.edu.cn/sist_en/2020/0902/c3863a55279/page.htm*

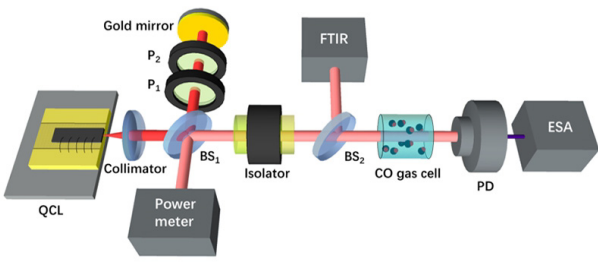


Students' Awards and Honors:



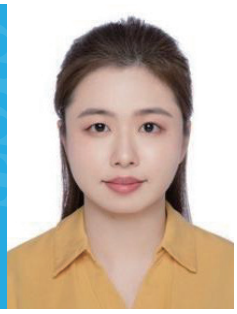
Li Rui, a senior undergraduate student from the research group of Professor Ha Yajun, had a paper accepted by ACM / IEEE Design Automation Conference (DAC 2020) (Paper title: DVFS-Based Scrubbing Scheduling for Reliability Maximization on Parallel Tasks in SRAM-based FPGAs) as the first author.

Bin-Bin Zhao and Xing-Guang Wang from Prof. Cheng Wang's Group devised a method to narrow the spectral linewidth of quantum cascade lasers (QCLs), which only requires a mirror to provide light reflection. This technique narrows the laser linewidth by 70 times, and the corresponding phase noise is reduced by 4 orders of magnitude. This result is now published in the renowned journal <ACS Photonics>, titled as Strong optical feedback stabilized quantum cascade laser.



Qin Qi, SIST master students, released their new book "From 0 to 1: Becoming CTFer "at the Fourth "Qiangwang Cup" National Cyber Security Challenge Reading Festival. This book was authored by Nu1L Team and Qin Qi is one of the main members.

Faculty Profiles



Prof. Wang Yang

Dr. Wang Yang received her Ph.D. degree in control engineering from Imperial College London, U.K. Her research interests include output regulation, estimation, adaptive control, nonlinear control, multi-agent systems and its applications. Let us listen to her sharing about herself and joining ShanghaiTech.

I am really glad to have the chance to share with you the story of my life and how I joined our big family of ShanghaiTech.

I grew up in a small city in southwest of China. During my childhood, two great women, Madam Curie and J.K. Rowling, had tremendous influence on the formulation of my personality, the idea of future career and the strong belief that I must do what I love for a living.

Through Rowling's books, I developed a strong interest in the Western culture, especially for the old and mysterious European countries. Going abroad and exploring the world became one of my dearest dream since that time. As for my strong interests in science and technology, obviously, were initially nurtured by Madam Curie via her autobiography and a movie about the discovery of radium. Before I could understand what scientists are really doing, I am already fell in love with the concepts like laboratory, experiment, and research.

This gives me a strong motivation to study hard, especially for the science subjects. I have to admit it, my hometown is not a well-developed city. Twenty years ago, people lived there suffered seriously from environment problems and lack of good education resources. But I am a lucky girl, with my family's support and personal effort, I managed to get into one of the best high schools in Sichuan Province.

Unfortunately, after high school's study, it seems I have few gifts in chemistry, but I do find myself to have passion about math and physics. In addition, at the beginning of the 21st century, the information science had started to show its great power in changing our world and modern life. I was completely fascinated by the newly developed communication techniques. And Shanghai, as one of the most attractive and energetic cities in China, has long been the place that I yearn for.

So, the choice of major and university is not so hard for me. I was excited to be admitted by the department of Electrical and Electronic Engineering of Tongji University.

The education during my undergraduate study nurtured my mathematical and engineering thinking ability, which is fundamental for my further research work. The turning point came at the end of the junior year. I got a chance to continue my postgraduate study in Tongji University without exam. It was a great honor and a precious chance, but I had a strong feeling that it was not what I want.

Actively altering the life track and starting a new beginning takes courage, but the later years' experience proved that it is definitely worth taking the risk if you have something you truly long for. After a few sleepless nights, I finally decided to go abroad and to continue my graduate study.

The old and mysterious island on the westernmost corner of Europe was my first choice, of course, Mrs. Rowling owes a big credit. And luckily, I got an offer from one of the G5 universities in UK. I continued my graduate study in Imperial College London, where I gained a solid knowledge in math, along with information science and engineering.

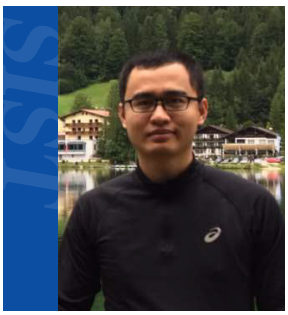
After one years' study, I graduated with a distinctive degree from the master program and got an offer for a fully funded PhD position in IC. To be frank, at that stage, I was still not sure about what I would be going to do for a living in the future. Being a researcher was no longer a little girl's dream, it became a real career and lifestyle choice. After extensive investigation and discussion with my supervisor, I eventually decided to cherish this opportunity and pursued a PhD degree with Prof. Parisini, who is a truly expert in the control community. During the next five years, I mainly focused on the adaptive control and system theory, with the applications of disturbance attenuation and model uncertainty.

At the end of my PhD study, I started to consider continuing my research career back in China. But at that time, I haven't decided to work in Academia. I gave myself a short vacation to rest, to travel and to search for the job that will really fulfill my value. Then one day, I saw the advertisement of a young scholar's forum held in ShanghaiTech. That is where my story with ShanghaiTech began.

This young and ambitious university drew my attention and I decided to go there to check in person. Then I flew from London to Shanghai and participated in the forum. It was just a two-days' forum, but I felt something different, something I never experience in other 'traditional' universities. I suddenly realized that ShanghaiTech is not merely a 'new' university, it is something 'new' in the current higher education in China. Building a world-class research institution in here is not just slogan, SIST gives the most respect and provides sufficient support to the young researchers. After the talk with the dean of the department and other professors, I feel this was the right place for me, where I can have a good platform with enough freedom and tremendous resource to do independent and high-quality research. After the on-site interview, I was fortunate enough to join the SIST family.

Time flies and it has already been over one year since I graduated and then later joined SIST. This half year was the most unusual to me, not only because the new job, new environment and new challenges, but also due to the unexpected coronavirus pandemic. Maybe you share my anxiety when the lifestyle we are familiar with is suddenly unavailable and freedom is limited, but our university did not let those feelings last long. Various solutions were proposed to keep our students and teachers united and be able to continue our study and research. Despite the fact that the workplace was moved to online, life in the past six months is still fulfilling and exciting, doing research, giving lectures and participating the recruitment of new students. This is the time when the young scientists show their creativity and the ability of solving any difficulties them met. That's what we do, right? Embrace any challenge given to us and be unstoppable!

Looking back, I am really grateful for all the people who guided me, encouraged me and gave me the opportunity to keep doing what I love and finally become who I dreamt to be when I was a little girl. Last, special thank should be given to SIST, my first half year here were unforgettable, and the future shall be even more exciting.



Prof. Qiu Yue

Dr. Qiu Yue obtained his Ph.D. degree in applied mathematics at Delft University of Technology, Delft, the Netherlands. His research focuses on designing fast computational algorithms for the simulation, optimization, and uncertainty quantification of large-scale dynamical systems governed by partial differential equations (PDEs) using low-rank approximation. Let us listen to his sharing about himself and joining ShanghaiTech.

Fascinated by the international atmosphere at ShanghaiTech, I did not hesitate about joining when being offered with a tenure-track assistant professor position, though the next journey seems much more challenging than being with other universities in China. Already seven months since starting at SIST, I am still impressed and excited. Looking back, I greatly appreciate having the chance to work with international, intelligent, independent, and passionate students and colleagues.

Growing up with interest in automatic control of robots and aircrafts, I chose industry automation as my subject of bachelor study at Northeastern University where there exists a National Key Laboratory of Synthetical Automation. As a freshman, I passed the selection test of the Talent Program at the School of Information Science and Engineering and thereafter I had the chance to study an even broader topic which includes computer science, electrical engineering, and telecommunications. After days and nights spent in computer programming, EE labs and professors' research groups, I realized that despite the problems being with different categories, they can always be explained and solved by mathematics.

For me, math is not only logic and computations, but also a philosophy. Following this line, I decided to pursue my PhD at Delft University of Technology in the Netherlands where I was given the chance to conduct research on developing mathematical tools for offshore wind farm control and optimization. The project I worked on is jointly carried out between the Applied Mathematics Department and the Control

Department. The problem-oriented research at TU Delft sharpened my mind and benefited me lifelong. This stage had built a solid foundation of my research in numerical algorithms for PDE-constrained optimization and strengthened my interest in applied mathematics. Therefore, I did not hesitate to defend my doctoral dissertation at the Mathematics Department.

After a formal Dutch doctoral defense ceremony and a sadly farewell with friends and colleagues in the Netherlands, I moved to the Max Planck Institute in Germany to continue my research on mathematical algorithms for dynamical complex systems with a focus on quantifying the uncertain dynamics. The German style of research seems quite European to me while the Dutch style is pretty American though they are neighboring countries. The multicultural research training cultivates my thought and motivates me to step further, which leads me to Shanghai-Tech, a perfect place with high freedom to perform research activities.

Thanks to the intercultural profile, passionate students and faculties, and supportive administrative staff, at the new starting point, I feel motivated, inspired and confident to set up my own research group. Looking forward, I cannot wait to contribute my effort to make ShanghaiT-ech a world-renowned university.

Prof. Liao Qifeng

Dr. Liao Qifeng obtained his Ph.D. degree in applied numerical computing from the School of Mathematics of the University of Manchester. His research focuses on efficient numerical methods for PDEs with high-dimensional random inputs. Let us listen to his sharing about himself and joining ShanghaiTech.

In March of 2015, I joined the family of SIST. SIST has been growing up fantastically, and I am very lucky to have this great opportunity to serve as a teacher in SIST. When I was a student, I observed that the best teachers were those who put most effort into teaching, which led to well-organized lectures, clear explanations and providing interesting examples. They also always showed their great interests in the courses, and motivated us through their positive emotions. Moreover, they would like to interact with us, and were always very nice and patient to answer our questions. To become one of these serious teachers was my ideal, and I have been striving towards this goal since I became an assistant professor at ShanghaiTech in 2015. So, student-centered and outcome-based teaching is my teaching philosophy, and serving for excellent teaching is my top obligation as a faculty. After five years of hard working in teaching, I'm very excited that I obtained the Excellence in Teaching Award from SIST in 2019, and I consider this is the most honorable award that I have obtained.

Teaching mathematical courses was a major part of my work during the last five years. I have taught six different courses in mathematics. The most successful experience in my teaching experiences is my Numerical PDEs course for SIST graduates, while as the content of this course is changing dramatically, it will be replaced by a new course, of which the name is Applied Numerical Computing in SIST. During my first time in teaching this course in 2016, I focused on the detailed analysis of finite differences and finite elements. I interacted a lot with our graduates during my teaching, and I realized that their need was not so mathematics oriented. As they were graduates in computer science and electronic engineering, they wanted to lean the numerical methods to solve their engineering problems. Based on the outcome-based teaching philosophy, I gradually changed my teaching materials every year to fit the students' need. In 2017, I added a lot of programing materials in the course, and I made sure every student can implement the finite differences and the finite elements correctly. I also added Bayesian inference, the multigrid methods, the level set methods, and the domain decomposition methods in this course. After that, I added the model reduction materials in the course, including POD, reduced basis, and empirical interpolation. My goal is that, after studying this course, students can obtain the necessary computational skills to do research in their domain areas, and know the popular research topics in computational mathematics. I believe that teaching and research are correlated---teaching advanced graduate courses motivates researchers to pursue frontier researches, and progresses in research can provide the most advanced teaching materials.

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NEWSLETTER

Faculty Recruitment

JOIN US !

Tenure-Track and Tenured Positions

School of Information Science and Technology (SIST)

ShanghaiTech University invites highly qualified candidates to fill multiple tenure-track/tenured faculty positions as its core team in the School of Information Science and Technology (SIST). We seek candidates with exceptional academic records or demonstrated strong potentials in all cutting-edge research areas of information science and technology. They must be fluent in English. English-based overseas academic training or background is highly desired.

Academic Disciplines:

Candidates in all areas of information science and technology shall be considered. Our recruitment focus includes, but is not limited to: computer science and technology, electronic science and technology, information and communication engineering, applied mathematics and statistics, data science, robotics, bioinformatics, biomedical engineering, internet of things, smart energy, computer systems and security, operation research, mathematical optimization and other interdisciplinary fields involving information science and technology, especially areas related to AI.

Compensation and Benefits:

Salary and startup funds are highly competitive, commensurate with experience and academic accomplishment. We also offer a comprehensive benefit package to employees and eligible dependents, including on-campus housing. All regular ShanghaiTech faculty members will join its new tenure-track system in accordance with international practice for progress evaluation and promotion.

Qualifications:

- Strong research productivity and demonstrated potentials;
- Ph.D. (Electrical Engineering, Computer Engineering, Computer Science, Statistics, Applied Math, or related field);
- A minimum relevant (including PhD) research experience of 4 years.

Applications:

Please refer to the following link or the QR code for more information: https://www.wenjuan.com/s/MFzQ-jeO/

Deadline: December 30, 2020
If you have any questions, please contact us :sist@shanghaitech.edu.cn

- **For the postdoc positions, please refer to the following QR code:**