Ning Kang

Research Fellow

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Nanyang Technological University postdoc in **wireless charging** with 8-year experience in **circuits and software algorithms**, familiar with various details of wireless charging systems. Experience and creativity allow combining wireless charging technology with other cutting-edge fields like **wireless capsule endoscopy and wireless robotics**. If you need a reliable researcher to help with advanced and complex exploratory tasks, I am the best choice.

EDUCATION

Shanghai Jiao Tong University (SJTU) — Shanghai, China
Ph.D. degree in electrical and computer engineering; GPA: 3.55/4.00 — *Sept.2017 – Dec.2022*

Nanjing University of Aeronautics and Astronautics (NUAA) — Nanjing, China
B.E. degree in information engineering; Core GPA: 4.3/5.0, **Ranking: 2/139** — *Sept.2013 - Jun.2017*

SELECTED PUBLICATIONS

A. Kang N, Liu M, Ma C, et al. *Analysis and Implementation of 3D Magnetic Field Shaping via a 2D Planar Transmitting Coil Array.* IEEE Transactions on Power Electronics (TPEL) — Published *Apr.2021*

- Achievement:

1. Received **a 9/10 rating** from reviewers, the highest among our lab's fifty journal papers.
2. Reviewers comment: "**very strong research contribution or technical impact**, "and "It **must be good knowledge** to engineers and researchers."

- System performance:

1. Charged multiple devices each with six degrees of freedom **(6-DoF)**.
2. Charged a **perpendicular** device with 82% dc-dc efficiency and 45 W power.

B. Kang N, Lee CHT, et al. *Magnetic Field Projection and Current Phase Control in a 2-D Planar Transmitting Coil Array.* IEEE Transactions on Power Electronics (TPEL) — Published *Sept. 2024*

- Achievement:

1. Featured on the **Sept. 2024 IEEE TPEL cover**, first among over 50 papers.
2. Received the **Top 10** 1st Stage Proposal Award in **IEEE Global Wireless Power Competition**.

- System performance:

1. Designed a system to detect **6-DoF** receivers' positions and optimize power output in **25ms**.
2. Programmed **10,000+ lines of code** for control algorithms on STM32 and FPGA.

C. Zheng T, **Kang N,** Lee CHT, et al. *Wireless Powered Capsule Robots with a Wide Locomotion Range and Random Orientation via Planar Transmitting Coils.* IEEE Robotics and Automation Letters (RAL) — Published *Jan. 2025*

- System performance:

1. Delivered 1W wireless power to a capsule robot in **any position and orientation**.
2. Transmitted **high-resolution images** in an ex vivo digestive system via Wi-Fi.

Project Experience

A. National Natural Science Foundation of China (NSFC 2020): Project Leader
Spatial Six-DoF Magnetic Field Shaping for Wireless Power Transfer *Jan.2020 – Jan.2024*

- Achievement:

1. Planned and wrote applications to help our lab **receive top state funding for the first time**.
2. Designed and implemented all the hardware, including the control circuits and power circuits.
3. Led other members in building the software part.

B. Business cooperation project with Xiaomi Corporation: System Engineer
High Spatial Freedom Wireless Power Transfer for Consumer Electronics *Mar.2019 – Mar.2023*

- Achievement:

1. Developed **a virtual experimental platform with self-training functions** to optimize algorithms.
2. Showcased charging system at Xiaomi Global Core Suppliers Conference.
3. Controlled the system to charge current products based on STM32.
4. Assisted Xiaomi in mass-producing charging systems.

C. Cooperation between SJTU and enterprises: Software Engineer
Synchronous Rectifier with Optimal Drain-source-voltage Tracking *Sept.2017 – Dec.2020*

- Achievement:

1. Succeeded 97.0% rectifier efficiency and 91.6% system efficiency at 120W output power.
2. Developed high precision closed-loop control of **0.18ns resolution** based on FPGA platform.
3. Achieved 0.12% duty cycle resolution and 0.4 degrees phase shift resolution for MHz drive signals.

Skills Summary

Languages: C (for STM32), Verilog (for FPGA), Wolfram Language, MATLAB.
Design Tools: Altium Designer, Ansys HFSS, SolidWorks, Advanced Design System, AutoCAD.
Academic Tools: KeyShot, Visio, Origin, CapCut, LaTeX, Adobe Photoshop, SAP Ariba Buying.

Selected Honors

Cover feature, IEEE TPEL – first among over 50 papers	*Sept.2024*
Top 10 Inspirational Person at Shanghai Jiao Tong University	*Mar.2023*
IEEE Global Student Wireless Power Competition: Top 10 1st Stage Award	*Apr.2022*
National Electronic Design Competition: Third Prize (team leader)	*Sept.2016*
Provincial Electronic Design Competition: First Prize	*Aug.2016*
Chancellor Award: Outstanding Research Team (team leader)	*Dec.2015*
National Scholarship	*Oct.2015*

Service Experience

Reviewer of IEEE journals and conferences	*Sept.2017 – Present*
Volunteer of UM-SJTU Joint Institute Open House (four times)	*Jun.2018 – Jun.2020*
Teaching assistant at SJTU Summer Design Expo (twice)	*Apr.2018 – Oct.2019*

More Contact Details

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