Sangin Kim

Seoul, Republic of Korea (KR)
+82)10-9925-5407 | sangin0926@gmail.com | https://timothee9626.github.io/portfolio/

June 13, 2024

Dear Professor Ali Javey,

I am reaching out to you concerning the Ph.D. position in your laboratory. It is a great pleasure for me to apply for the Ph.D. position in Materials and Device Innovation research at UC Berkeley. I've submitted this letter of application. With my experiences and background, I believe I am well-qualified to meet the requirements of the project as a Ph.D. candidate.

To briefly introduce myself, I am currently pursuing a Master's degree in Electrical Engineering at Yonsei University in Seoul, Korea, with a focus on bioengineering. I fully expect to complete my degree by February 2025. I have a long-standing interest in studying Wearable and Stretchable bioelectronics for long-term healthcare monitoring. My academic and research experiences have prepared me well for the challenges and responsibilities of a Ph.D program.

During Master's degree, it was an opportunity for me to enlarge my knowledge in bioengineering, particularly in the development of components for fabricating soft and stretchable electronics. I was involved in three major projects:
1) Harvesting energy from human bodies to power wearable and implantable devices
2) Developing stretchable interconnects with liquid metal for long-term health monitoring biosensors
3) Designing analog circuits for the integration of circuits into a wide range of chips

These projects provided me with the opportunity to understand the overall construction and operation of various types of biosensor devices. In addition, not limited to bioengineering, leveraging my experience in designing analog front-end circuits, I designed and supervised the hardware circuit design for various sensors in each project.

I believe that pursuing a Ph.D. will build on my current research experience and expose me to new areas where bioengineering knowledge is both necessary and crucial. I am confident that my passion, dedication, and responsibility will enable me to succeed in my project during my Ph.D studies.

I would welcome the opportunity to discuss my application with you further and look forward to hearing from you.

Yours Sincerely,

Sangin Kim

Sangin Kim, M.S.

Curriculum Vitae

Address: Seoul, Republic of Korea (KR)
Email: sangin0926@gmail.com
https://timothee9626.github.io/portfolio/
Phone: +82)10-9925-5407

Research interests

Flexible and stretchable electronics; Stretchable interconnects; Energy harvesting devices; Analog hardware circuit design

Education

Yonsei University, Seoul, KR — Present

- Master of Science, Electrical Engineering
- GPA: 3.8/4.3
- Advisor: Prof. Jungmok Seo

Chung-Ang University (CAU), Seoul, KR — Spring, 2022

- Bachelor of Science, Electrical Electronics Engineering
- GPA: 3.8/4.5

Research and Industry Experience

Yonsei University, Seoul, KR (Advisor: Prof. Jungmok Seo) — Spring, 2022 - Present
Researcher in Biological Interface and Sensor Systems (BLISS) Lab

- Stretchable Interconnects
  - Developing a solvent-free liquid metal paste through an ultrasonication process.
  - Fabricating biosensors including wearable keypads, temperature sensors, and EC sensors.

Seoul National University College of Medicine, Seoul, KR (Advisor: Prof. Jae Sung Lee) — Spring, 2022
Research Assistant in Functional & Molecular Imaging System Lab

- Positron Emission Tomography (PET)
  - Designed analog front-end circuit of sensor technology in the Positron Emission Tomography (PET) detector for diagnosing cancer.
  - Measured and optimized the efficiency of the Silicon Photomultiplier (SiPM) using developed PCBs.

Power Master Semiconductor Company (PMS Co.), Gyeonggi-do, KR — Spring, 2021
Research Internship

- Power master semiconductor
  - Analyzed and revised the design of the Power Management Integrated Circuits.
  - Performed testing and simulation on newly designed and manufactured SiC power semiconductor chips.
  - Utilized equipment such as Source Meters, Function Generators, and Oscilloscopes for accurate measurements.

Publications

[1] **S. Kim*** et al., “Highly Adhesive Liquid Metal Paste for Stretchable Electronics”, in preparation.

[2] S. Kim, **S. Kim**, et al., “Sintering-free Liquid Metal Ink for Stretchable Printed Electronics”, in preparation.

[3] T. Kim, S. An, Y. Kim, S. Han, J. Lee, K. Park, **S. Kim**, J. Park, S. Kim, J. Chung, S. Cho, J. Seo., (2024) “Lubricant-Infused Polymeric Interfaces: A Stretchable and Anti-Fouling Surface for Implantable Biomaterials”, Advanced Functional Materials, 34, 2312740 (2024)

Conferences

[1] **S. Kim** et al., (2023). "Scalable Manufacturing of Stretchable Electronic Devices based Biphasic Liquid Metal Paste". Abstract and Poster at IEEE Nanomed Conference 2023, Okinawa, JP **(Selected as Best Poster Competition)**

Awards

Academic Research Fellowship, Yonsei University Sep 2023

- Award given to a graduate student who has derived outstanding research to lead the future, awarded by the President of Yonsei University

Teaching Experience

Yonsei University, Seoul, KR Fall, 2023

Teaching Assistant, "Fundamentals of Semiconductors" & "Capstone Design"

- Prepared "Fundamentals of Semiconductors" lectures, helped students with term papers, and graded homework.
- Provided support to students in "Capstone Design" courses in the field of bioelectronics.

Private Educational Institue, Seoul, KR 2018-2020

Mathematics Teacher

- Educated high school students in Seoul, Korea, including all aspects of classroom management, lesson planning, instructional delivery, and academic support.
- Topics included Algebra I & II, Functions & Calculus, Geometry, Probability & Statistics & Discrete Mathematics.

Leadership

CAU Band "Muse" club, Seoul KR 2018-2021

VP of Community Relations, Treasurer

- Organized and facilitated various club events and hosted band performances.

Relevant Skills

- Hardware Design: LT spice, Pspice, and Altium design
- Computer: Microsoft Word, Excel, PowerPoint, MATLAB, and basic C++
- Graphic design: Photoshop, Illustrator, Lightroom and Premier Pro

References

Prof. Jungmok Seo	**Prof. Jae Sung Lee**	**Jae-Gil Lee**
Professor	Professor	CTO
Department of Electrical Engineering	Department of Nuclear Medicine, Bioengineering	R&D Team
Yonsei University	Seoul National University	Power Master Semiconductor
Research Advisor	Research Advisor	Executive
jungmok@yonsei.ac.kr	jaes@snu.ac.kr	jaegil.lee@powermastersemi.com
+82-2-2123-7803	+82-2-2072-2938	+82-010-4508-2324