TAI LE

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SUMMARY

Highly motivated Ph.D. in Biomedical Engineering with 6+ years of experience in wearable biomedical devices. Skilled in bioelectronics, hardware and embedded system design, data analysis, and team collaboration. Proven track record of securing research funding and leading cross-functional teams in clinical and international settings. Seeking a postdoctoral position to apply expertise in biomedical research and development.

EDUCATION

University of California Irvine, CA **Sep 2018 – Apr 2024**

- PhD. in Biomedical Engineering
- MSc. in Electrical Engineering and Computer Science – GPA: 3.89/4.0

University of Washington, WA **Sep 2017 – Jun 2018**

- MSc. in Electrical Engineering and Computer Science – GPA: 3.82/4.0 (*Finished first year in Master and moved to UCI*)

Hanoi University of Science and Technology, Hanoi, Vietnam **Aug 2010 – Jun 2016**

- B.Sc., in Electronics and Telecommunications – GPA: 3.5/4.0

COLLABORATION & GLOBAL IMPACT

Fetal/Maternal Health (Clinical & International)

- **UCI Medical Center:** Collaborated with **Prof. Afshan B. Hameed** (Dept. of OB/GYN & Cardiology) to conduct a clinical trial on 10 pregnant subjects, validating the efficacy of a novel non-invasive ECG patch.
- **Global Health Expansion:** Establishing a large-scale trial (200 subjects) in Vietnam through a partnership with **VinMec Hospital** and **Hanoi University of Science and Technology**, supported by a **~$235,000 grant** from the Vingroup Innovation Foundation.

Translational Animal Models

- **Mayo Clinic Research:** Worked closely with **Prof. Xiaolei Xu** to deploy a high-throughput zebrafish ECG system. Spent one week on-site at Mayo Clinic to integrate the platform into their workflow, resulting in high-impact publications on cardiac phenotypes.

International Mentorship

- **Vin University:** Mentored a team of 3 undergraduate students to secure a **$13,000 VentureWell BME-IDEA International Grant**. Participated in the Pioneer Workshop to guide their commercialization strategy.

SKILLS

- **Programming languages**: C/C++, Matlab, Python, Java, C#.
- **Software:** Matlab, Arm Keil MDK, LabView, TINA-TI Spice, Android Studio, Altium Designer, Version Control (Git), SolidWorks.
- **Protocols:** I2C, SPI, UART, JTAG debuggers, Bluetooth Low Energy (BLE).
- **Platforms:** ARM Cortex M4 processor (STM32, nRF52 - Nordic chips); FreeRTOS
- **Lab workbench tools:** Function Generator, Oscilloscope, CHI Instruments, Logic Analyser, Soldering Station, Reflow Oven, 3D Printer.
- **Microfabrication:** Cleanroom experience (photolithography, oxidation, diffusion, etching, RCA cleaning and thin film deposition), hands on experience in handling various equipment, including Mask aligner/UV exposer, Furnace, Metal Sputter, Spin-Coater, Profilometry etc.

PATIENTS

- **Active Dry Electrodes – Based Wearable ECG Monitoring**. Vietnam Patent No. 2-2023-00359, granted 2024.
- **Lullaby Algorithm – Fetal Peak Detection Using Periodicity.** U.S. Patent Application Publication US 2023/0363687 A1 (2023, pending).

PROFESSIONAL ACTIVITIES

Reviewer

- IEEE Access
- Scientific Reports
- IEEE Transaction in Biomedical Engineering
- IEEE Sensor Journal
- IEEE Sensor Conference

Oral Presentation

- Annual Int. Conference of the IEEE Engineering in Medicine & Biology Society (EMBC) - 2020
- IEEE MTT-S International Microwave Biomedical Conference (IMBioC)- 2018, 2019
- Health Technology Assessment international (HTAi) meeting - 2018
- IEEE Sixth International Conference on Communications and Electronics (ICCE) – 2016

RESEARCH EXPERIENCE

Hung Cao research group, UC Irvine, CA | Graduate Student Researcher **Sep 2018 – Dec 2023**

Fetal/Maternal ECG (fmECG) Patch Monitoring

- Investigated and evaluated non-contact sensors (ANCE) and photoplethysmography (PPG) modalities for fmECG acquisition.
- Designed, built, and validated wearable sensor prototypes against motion artifact.
- Led multi-functional teams to design and perform a clinical trial (n = 10) at UCI Medical Center.
- Secured **Proof of Product (POP) grant ($80 k)** from UCI Beall Applied Innovation to support technology translation.

High-Throughput Zebrafish Cardiac Monitoring (Zebra II System)

- Designed and fabricated electrode array membrane and wireless data acquisition for high-throughput ECG monitoring system for zebrafish cardiac studies.
- Developed the **first prolonged ECG monitoring platform** enabling simultaneous recordings from multiple **awake** zebrafish.
- Research outcomes directly contributed to securing **NIH SBIR Phase II award ($1.6 mil)** with Sensoriis, Inc.

Hung Cao research group, University of Washington, WA | Graduate Student Researcher **Sep 2017 – June 2018**

Zebrafish ECG Signal Analysis

- Developed ECG signal processing pipelines and feature extraction methods for zebrafish cardiac data.
- Applied machine learning models (ANN and K-means) for cardiac disease classification.

INDUSTRY EXPERIENCE

Vena Vitals Inc., Irvine, CA (backed by YC) | Senior Electrical Engineer **Dec 2023 - Present**

- Lead full-cycle PCB design: Specification design, part selection, schematics/ PCB layouts, bring-up, test, debug, and system integration.
- Design and execute medical device testing: Verify and validate according to regulatory requirements.
- Collaborate cross-functionally: Work with mechanical, software, clinical, and data science teams to deliver fully functional product.
- Ensure regulatory compliance: Participate in design reviews, document and support EMC/EMI and safety testing (IEC 60601) for FDA 510(k) submission.
- Deploy and collect clinical data: Work with doctors to deploy the device on multiple clinical sites, collecting data on over 500 patients.

Vena Vitals Inc., Irvine, CA (backed by YC) | R&D Engineering Intern **Summer 2023**

Continuous blood pressure monitoring with strained sensors

- Designing and developing electronics and PCBs for data capture, as well as improving or miniaturizing existing designs.
- Developing firmware for communication between the electronics and software layers.
- Signal-processing of physiological data to remove sensor noise, environmental drifts, and motion artifacts.

Integrated Medical Sensors Inc., Irvine, CA | Firmware Engineer (Intern → Part-time) **June 2022 – Dec 2023**

Wireless continuous Glucose monitoring

- Working on hardware design and firmware development using BLE nRF52 to send data from CGM to phone app.
- Optimizing the device's power consumption (> 48% reduction compared with previous version).
- Handling data received and transmitted from sensors.

Sensoriis, Inc., Edmonds, WA | Electrical Engineering Intern **Summer 2020**

Further research and develop Zebra II system

- Worked closely with the company's Director of Engineering for product development:
  - Defined product requirement specifications and determined minimum viable product (MVP).
  - Designed and performed experiments to validate the feasibility of the system, signal integrity, and other added features.
- Optimized firmware and mobile application to integrate with Google Cloud Platform for data signal processing and analysis.

WITFIT Ltd, Oxford, UK | Firmware Engineering Intern **Summer 2019**

EEG headset for Attention Deficit Hyperactivity Disorder (ADHD) monitoring

- Developed firmware using nRF52 Nordic and hardware PCB design for the device.
- Designed a mobile application in Android for data collection via Bluetooth Low Energy.
- Implemented Flanker Task - a set of response inhibition tests to the mobile app for ADHD experiment.

Institute of Population, Health and Development, Hanoi, Vietnam | R&D Engineer **Aug 2015 – Aug 2016**

Active dry electrodes – based wearable ECG monitoring

- Developed firmware and hardware PCB design for the device.
- Created experimental protocol and managed clinical trials with 230 volunteers to validate the device.
- Won 3rd place in Texas Instrument Innovation Challenge Contest (National Final).

LEADERSHIP EXPERIENCE

Student mentorship (TA) at Biodesign class (2022-2023)

- Scheduled weekly seminars with experts in medical field, sharing various topics such as FDA regulation, FMEA and quality control, and clinical trial.
- Supported 23 groups in class regarding technical issues in their projects (coding troubleshoot, electronic circuit…).

Student mentorship at Hung Cao research group

- Supervised a Master student working on his thesis project: Blood pressure estimation with armband.
- Led and supervised a group of 2 PhD students and 2 undergraduates working on fetal/maternal ECG patch (POP grant).
- Supported and mentored 5 capstone projects (3-5 seniors working for each capstone project).

UCI Summer Undergraduate Research Fellowship (SURF) mentor

- Supported and mentored a senior working in EEG acquisition with non-contact electrodes (Mentee: Ceyu Xu – now moved to Duke University for his PhD).
- Supported and mentored a junior working in smartphone-based speckleplethysmographic (SPG) measurement (Mentee: Zihao Zou – now moved to University of North Carolina at Chapel Hil for his PhD).

STEAM for Vietnam – Summer coding bootcamp 2020

- Provided world-class STEAM education for nearly 7000 Vietnamese children (8-16 years old).
- Organized content and worked with others to prepare game developed on Scratch for each class.

SELECTED PUBLICATIONS (Full list - https://shorturl.at/fcXXV)

1. **Le T**, Hau L, Loan Nguyen, Hung Dao, et. al Investigation of Using Non-Contact Electrodes for Fetal ECG Monitoring. IEEE Transactions on Instrumentation and Measurement, vol. 74, pp. 1-10, 2025, Art no. 4019810, doi: 10.1109/TIM.2025.3628430.
2. T. Nguyen-Quang, **T. Le**, D. N. Minh, H. Cao and H. -D. Han, "Fetal QRS Detection from Single-Channel Abdominal ECG by Adaptive Improved Clustering," 2024 IEEE 20th International Conference on Body Sensor Networks (BSN), Chicago, IL, USA, 2024, pp. 1-4, doi: 10.1109/BSN63547.2024.10780673.
3. Torres, R. S. T., Huang, M., Benomar, M., **Le, T.**, Etchells, T., Xu, X., Lau, M. P. H., Cao, H. Zebra II as A Novel System to Record Electrophysiological Signals in Zebrafish. J. Vis. Exp. (210), e67066, doi:10.3791/67066 (2024).
4. Ding, Y., Lang, D., Yan, J., Bu, H., Li, H., Jiao, K., Yang, J., Ni, H., Morotti, S., **Le, T.** et al. . (2022). A phenotype-based forward genetic screen identifies Dnajb6 as a sick sinus syndrome gene. Elife 11, e77327. https://doi.org/10.7554/eLife.77327.
5. **Le T**, Zhang J, Nguyen AH, Trigo Torres RS, Vo K, Dutt N, Lee J, Ding Y, Xu X, Lau MPH, Cao H. A novel wireless ECG system for prolonged monitoring of multiple zebrafish for heart disease and drug screening studies. Biosensors & Bioelectronics. 2022 Feb 1;197:113808. doi: 10.1016/j.bios.2021.113808. Epub 2021 Nov 16. PMID: 34801796.
6. **T. Le**, I. Clark, J. Fortunato, M. Sharma, X. Xu et al., "Electrocardiogram: Acquisition and analysis for biological investigations and health monitoring," in Interfacing Bioelectronics and Biomedical Sensing, H. Cao, T. Coleman, T. K. Hsiai, and A. Khademhosseini, Eds., ed Cham: Springer International Publishing, 2020, pp. 117-142.
7. **Le T**, Ellington F, Lee T-Y, Vo K, Khine M, Krishman S, Dutt N and Cao H, "Continuous Non-invasive Blood Pressure Monitoring: A Methodological Review on Measurement Technologies," in IEEE Access, 2020, doi: 10.1109/ACCESS.2020.3040257.
8. **Le T**, Zhang J, Xia X, Xu X, Clark I, Schmiess-Heine L, Nguyen AH, Lau MPH, Cao H. Continuous Electrocardiogram Monitoring in Zebrafish with Prolonged Mild Anaesthesia. Annu Int Conf IEEE Eng Med Biol Soc. 2020 Jul; 2610-2613. doi: 10.1109/EMBC44109.2020.9175576.PMID: 33018541.
9. **T. Le**, M. Lenning, I. Clark, I. Bhimani, J. Fortunato, P. Mash, X. Xu, H. Cao "Acquisition, Processing and Analysis of Electrocardiogram in Awake Zebrafish," in IEEE Sensor Journal, 2019.

HONORS AND AWARDS

- Winner at MIT Hacking Racism in Healthcare Challenge (Hackathon) with the participation of 400 people – 2021.
- Research assistantship, University of California Irvine (2018 – 2023).
- Research assistantship, University of Washington (2017 – 2018).
- Hella Entrepreneurship Prize - given for team with the best business model (2015).
- 3rd place in Texas Instrument Innovation Challenge Contest (National Final) (2015).
- 1st place – Speed Idea Pitch – VietAbroader Career Talk (2015).
- Certificate of merit for remarkable efforts in study given by Sumi Vietnam Wiring Systems Co., Ltd. (2014).

REFERENCES

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