Gavin Lou

Biomedical engineer, researcher, and technical founder · Academic and technical CV

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PROFILE

Gavin Lou works across biomedical engineering, applied sensing, machine vision, and venture execution. His research and product work spans portable gas chromatography, metal-oxide sensors, breath analysis, real-time deformability cytometry, and reproducible scientific software. He has led approved public projects, founded two technology companies, published in Advanced Materials, and is an inventor on gas-sensing and cytometry patent applications.

APPOINTMENTS AND INDUSTRY EXPERIENCE

Postdoctoral Fellow, Biomedical Engineering · The Chinese University of Hong Kong **2023–Present**

- Co-developed quantitative imaging-focus control and machine-learning workflows for real-time deformability cytometry.
- Published a review in Advanced Materials and contributed to IEEE NEMS, IEEE-NANOMED, and MicroTAS conference papers.
- Coordinated approved applied-R&D and research-talent projects from proposal through reporting.

Founder and CEO · King's Phase Technologies Limited **2019–Present**

- Led metal-oxide sensing, portable gas-chromatography, embedded electronics, and breath-analysis projects from prototypes to trials.
- Completed the HKSTP Incu-Tech programme, managed six approved ITCFAS projects, and exhibited at CES 2023 and major Hong Kong technology fairs.
- Built and open-sourced tools for sensor acquisition, VOC preparation, cytometry imaging, and analysis.

Founder · XY Technologies Limited **2021–Present**

- Secured and managed a HK$600,000 MAKE a DASH funding offer.
- Directed prototype development, supplier coordination, patent work, staffing, and milestone reporting.

Project Manager · Taiyo Optronics **2016–2018**

Managed cross-functional technology projects in a manufacturing environment.

Research Assistant · King's College London **2015–2015**

Supported research around the European Space Agency's Gravity Loading Countermeasure Skinsuit.

EDUCATION

PhD, Biomedical Engineering · The Chinese University of Hong Kong

2019–2023

MSc, Biomedical Engineering · The Chinese University of Hong Kong

2018–2019

BSc, Biomedical Science (Physiology), Upper Second-Class Honours · King's College London, University of London

2012–2015

APPROVED FUNDING AND MANAGED PROGRAMME VALUE

HK$4.91M in public programme value managed, including **HK$3.02M across six approved ITCFAS projects**. Pending and under-consideration applications are excluded.

Programme	Period / status	Value
ITCFAS approved portfolio Six approved talent-development and applied-R&D projects, including a trial of a novel breath-ketone testing device.	2021–2026 Approved	HK$3,020,489.98
HKSTP Incu-Tech programme Incubation programme value managed as chief executive.	2020–2023 Programme completed	HK$1,290,000
CUHK MAKE a DASH Fund Youth entrepreneurship funding for XY Technologies.	2021–2022 Awarded	HK$600,000

The managed total combines six approved ITCFAS projects, the HKSTP Incu-Tech programme value recorded in the applicant's project-management CV, and the signed MAKE a DASH offer. It excludes pending or under-consideration applications, duplicate sub-projects, studentships, and the 2026 PILOTS LITE award.

HKSTP INCU-TECH PROGRAMME

6 July 2020–5 July 2023 · Programme completed. Completed HKSTP's three-year Incu-Tech programme while developing and commercialising portable gas-sensing and breath-analysis technology.

2020–2023 · Milestone-led R&D and reporting. Led programme milestones covering sensor calibration, MEMS and module development, prototype iterations, product software, intellectual property, trials, and commercialisation planning.

2021–2023 · Public demonstrations and market validation. Ran the SportLight public demo, collected structured user feedback, demonstrated prototypes to buyers and partners, and represented the company across Hong Kong and international showcases.

2021–2022 · Media and investor exposure. Participated in HKSTP-supported RTHK, HKET, and Ming Pao interviews, EPiC investor meetings, local press activity, and product presentations.

2021–2023 · Team and supply-chain development. Used HKSTP recruitment channels, progressed a manufacturing-partner MOU, coordinated beta testing, and prepared collaborations with sports and care-sector partners.

AWARDS AND COMPETITION WINS

2026 · PILOTS LITE Startup Award, PILOTS LITE programme. Selected for a startup award of up to HK$30,000.

2021 · Award for Nomination, Youth Novation Startup Competition. Awarded to In the Know / King's Phase Technologies with HK$5,000 prize money.

2019 · Most Outstanding Star — Innovation and Invention, The Chinese University of Hong Kong. Recognized for the ketone breathalyser invention.

2019 · Merit Award, Life Sciences (Innovation), 5th Hong Kong University Student Innovation and Entrepreneurship Competition. Ketone Breathalyzer.

2019 · Third Prize, Technology Entrepreneurship Plan, 5th Hong Kong University Student Innovation and Entrepreneurship Competition. Team award for '礙'講書.

COMPETITIVE SELECTIONS AND FINALIST PLACEMENTS

2026 · Selected CUHK representative, Asia Exhibition of Innovations and Inventions Hong Kong. Project selected to represent CUHK for the November 2026 exhibition.

2026 · Shortlisted, Co-ideation Programme, HKAI Lab × HKSTP. Shortlisted for panel assessment; due diligence was ongoing as of August 2026.

2022 · Finalist, CUHK Entrepreneurship Competition. King's Phase Technologies.

2022–23 · Shortlisted, Young Techpreneur Project. King's Phase Technologies.

2021 · Global Finalist / Top 160+, HKSTP Elevator Pitch Competition. King's Phase Technologies.

2021 · Finalist, EMedIC Global. Official finalist Team 03.

2020–21 · Grand Finalist, Hong Kong Social Enterprise Challenge. In the Know / King's Phase Technologies.

2020 · Finalist, Hong Kong ICT Awards — Student Innovation Award. Ketone detector project.

PUBLICATIONS

1. Light-Responsive Materials in Droplet Manipulation for Biochemical Applications
Guangyao Cheng, Chit Yau Kuan, Kuan Wen Lou, and Yi-Ping Ho. Advanced Materials 37, 2313935 (2025). DOI: 10.1002/adma.202313935

2. Gas Chromatography System for Metal Oxide Gas Sensor to Enhance Gas Species Selectivity
Kuan-Wen Lou, Guangyao Cheng, Qinru Xiao, and Yi-Ping Ho. IEEE NEMS, Chengdu, China (2026).

3. Autoencoder-Fine-Tuned LSTM for Improved Prediction of CO Concentration in Temperature-Modulated Metal-Oxide Sensor Arrays
Kuan Wen Lou and Yi-Ping Ho. IEEE-NANOMED, Hong Kong (2025).

4. Imaging Focus Control via Ring-Width Quantification Enables Standardized Mechanical Phenotyping in Real-Time Deformability Cytometry
Guangyao Cheng, Kuan Wen Lou, Qinru Xiao, and Yi-Ping Ho. MicroTAS, Adelaide, Australia (2025).

5. Minimal Flame Spray Pyrolysis (mFP) — One-Step Synthesis of Nanoscale Metal Oxide Material
Kuan-Wen Lou, Chun-Lung Ho, and Yi-Ping Ho. IEEE NEMS, Kyoto, Japan (2024).

6. Gas Chromatography System with a Modular Gas Sensor for the Regeneration of Sensor Sensitivity
Kuan-Wen Lou, Chun-Lung Ho, and Yi-Ping Ho. IEEE-NANOMED, Okinawa, Japan (2023).

PATENTS AND APPLICATIONS

2026 · Quantitative Focus Control Method for Deformability Cytometry Based on Ring Width Quantification
United States provisional application; application 63/977,364. Filed 6 February 2026. Inventors: G. W. Luo, Q. Xiao, G. Cheng, and Y. P. Ho.

2023 · A Breath Analyser Having Reduced Background Nitrogen
Hong Kong short-term patent; application 32023069933.4; HK30080846. Registry details recorded in institutional project CV; review before external filing. Inventors: Kuan Wen Lou.

2023 · A Breath Analyser
Hong Kong short-term patent; application 32022065658.3; HK30080843. Granted. Inventors: Kuan Wen Lou.

2023 · A Novel Gas Sensor
Hong Kong short-term patent; application 32022051430.3; HK30083430. Granted. Inventors: Kuan Wen Lou.

2023 · A Metal Oxide Sensor
Hong Kong short-term patent; application 32022054982.0; HK30083812. Granted. Inventors: Kuan Wen Lou.

TEACHING AND CURRICULUM DEVELOPMENT

2021–2025 · Guest Lecturer, BMEG3440 — Delivered. The Chinese University of Hong Kong. Delivered recurring guest lectures in 2021, 2022, 2023, 2024, and 2025 on open-source practice, engineering competition, technology development, and funding in biosensing.

2026 · Learning from Open Source: Why Your Competitors Aren't Your Enemies — Prepared. BMEG3440, The Chinese University of Hong Kong. Prepared a 19-slide lecture deck; delivery has not yet been confirmed.

2023 · STEM workshop curriculum design — Designed. King's Phase Technologies. Designed three bilingual workshop curricula: breath-gas comparison, organic-compound classification, and human-motion analysis using sensors.

HOSTED, SPEAKING, AND PROFESSIONAL SERVICE

12 July 2021 · Moderator, CUHK Entrepreneur Corner: HandyRehab. Moderated a one-hour founder conversation for alumni, founders, and students.

13 May 2022 · Presenter, MAKE a DASH Demo Day and Press Conference. Delivered the venture presentation at the programme demo day and press conference.

20 May 2022 · Discussant, Youth Entrepreneurship of Hong Kong in the Greater Bay Area — Think Again and Imagine the Future. CUHK Hong Kong Institute of Asia-Pacific Studies webinar.

20 July 2022 · Guest speaker, ASPN × HYPE GVA Taiwan Demo Day and Sports Innovation Forum. Presented King's Phase Technologies and joined the programme's post-event business matchmaking.

15 March 2024 · Research-group host, CUHK Biomedical Engineering literature-report meeting. Hosted a documented research-group literature-report session.

27 August 2024 · Host, Professor Alicia Jenkins visit to CUHK Biomedical Engineering. Hosted a departmental and laboratory visit.

30 August 2024 · Research-group host, CUHK Biomedical Engineering literature-report meeting. Hosted a documented research-group literature-report session.

3 January 2025 · Research-group host, CUHK Biomedical Engineering group progress meeting. Hosted a documented research-group progress meeting.

25 April 2025 · Research-group host, CUHK Biomedical Engineering group meeting. Hosted a documented group meeting and screening-test rehearsal.

17 October 2025 · Research-group host, CUHK Biomedical Engineering group progress meeting. Hosted a documented research-group progress meeting.

6 February 2026 · Research-group host, CUHK Biomedical Engineering proposal-defense rehearsal. Hosted a documented proposal-defense rehearsal.

24 April 2026 · Research-group host, CUHK Biomedical Engineering literature-report meeting. Hosted a documented literature-report session.

5 June 2026 · Research-group host, CUHK Biomedical Engineering literature-report meeting. Hosted a documented literature-report session.

7 August 2026 · Research-group host, CUHK Biomedical Engineering progress meeting. Hosted a documented research-group progress meeting.

14 August 2026 · Research-group host, CUHK Biomedical Engineering group meeting. Hosted a documented research-group meeting.

EXHIBITIONS AND PUBLIC SHOWCASES

November 2026 · Asia Exhibition of Innovations and Inventions Hong Kong — Scheduled. Selected CUHK representative; Palexpo and Hong Kong Exporters' Association, Hong Kong. Selected to represent CUHK; the exhibition is scheduled for November 2026.

17 February 2023 · HKSTP Incubation Programme Open Day × SportLight Demo Day — Company listed. Company showcase; Hong Kong Science and Technology Parks Corporation, Hong Kong Science Park. King's Phase Technologies was one of ten official showcase companies; personal attendance is not asserted.

5–8 January 2023 · CES 2023 — Eureka Park, Hong Kong Pavilion — Personally attended. Founder and exhibitor; Consumer Technology Association and HKTDC, Las Vegas, United States. Presented Beagle at the Hong Kong Pavilion and held buyer, partner, and media meetings.

30 November–2 December 2022 · HKTDC Entrepreneur Day — Personally attended. Founder, exhibitor, and public-tour presenter; Hong Kong Trade Development Council, Hong Kong Convention and Exhibition Centre. Exhibited King's Phase Technologies and delivered a presentation during the public tour.

13–16 October 2022 · HKTDC Hong Kong Electronics Fair — Autumn Edition — Confirmed exhibitor. Company exhibitor, booth 1E-A39; Hong Kong Trade Development Council, Hong Kong Convention and Exhibition Centre. Exhibited the company's breath-analysis platform in the Startup zone and prepared a Startup Smart Launch presentation.

14 October 2022 · Healthcare Innovation and Technology Summit — Company participation confirmed. Company exhibitor; CU Medicine and Hong Kong Science and Technology Parks Corporation, Hong Kong Science Park. King's Phase Technologies joined the exhibition; personal on-site attendance is not asserted.

23–24 September 2022 · CUHK Entrepreneur Day — Personally attended. Founder and exhibitor; The Chinese University of Hong Kong, CUHK. Exhibited King's Phase Technologies as a selected startup and joined the entrepreneurship competition programme.

5–7 August 2022 · Golden Age Expo and Summit — Booth represented with partner support. Company exhibitor; Golden Age Foundation, Hong Kong Convention and Exhibition Centre. The company booth was maintained with CUHK and HKSEC support after a team COVID exposure; personal attendance is not asserted.

27–30 October 2021 · HKTDC Hong Kong Electronics Fair — Autumn Edition — Confirmed exhibitor. Founder and company exhibitor, booth 1E-C21; Hong Kong Trade Development Council, Hong Kong Convention and Exhibition Centre. Presented AutoKeto and the company's breath-analysis technology to international buyers and care-sector visitors.

May–July 2021 · SportLight Pivot Table public demo — Completed. Incubatee demo company; Hong Kong Science and Technology Parks Corporation, Hong Kong Science Park. Ran a multi-week public product demo and reviewed structured user-feedback reports through the HKSTP SportLight programme.

NEWS AND MEDIA

March 2023 · CUHK Faculty of Engineering — ENGAGE, Entrepreneurs and Startup 2.0. Founder profile. Four-page issue profiling Kuan Wen Lou, King's Phase Technologies, and the Beagle breath analyser.

January 2023 · CES Daily, King's Phase Technologies / Beagle feature. Exhibitor media feature. HKTDC-arranged CES Daily coverage of the company's development journey; verified in the CES correspondence archive.

14 May 2022 · Ta Kung Pao, 'Greater Bay Area Youth Entrepreneurship Funding Scheme' nurtures 13 CUHK startup teams. Print interview. Quoted Gavin Lou on the development and Greater Bay Area plans of the breath-analysis venture.

14 May 2022 · Wen Wei Po, CUHK helps 13 teams pursue entrepreneurship in the Greater Bay Area. Print and online interview. Featured an extended interview and photograph discussing the breath analyser and commercialisation plans.

14 May 2022 · Sing Tao Daily, CUHK startup programme: five companies prepare to enter the Greater Bay Area. Print interview. Quoted Gavin Lou on the venture and its market plans.

12 November 2021 · HKTDC NewsBites, 7 Tech Products for Learning, Entertainment and Health Monitoring. Product feature. Featured AutoKeto and King's Phase Technologies following the Hong Kong Electronics Fair.

1 August 2021 · RTHK TV 31, Startup Generation Z: Finding the Unicorn, Part II. Television documentary interview. Featured Gavin Lou, the founding story of King's Phase Technologies, and the breath-analysis prototype.

15 June 2021 · Ming Pao, King's Phase Technologies founder interview. Media interview. Completed an HKSTP-arranged interview at Hong Kong Science Park; a public article link was not located.

31 May 2021 · Hong Kong Economic Times, King's Phase Technologies founder interview. Media interview. Completed a CUHK-arranged interview at InnoPort; a public article link was not located.

5 November 2019 · Sing Tao Daily, CUHK student develops a ketone-diet testing device and receives Outstanding Star honour. News interview. Profiled Gavin Lou and the ketone breathalyser invention with direct interview quotations.

5 November 2019 · The Chinese University of Hong Kong, CUHK Honours Outstanding Students of the Year. Institutional news release. Named Gavin Lou as Most Outstanding Star in Innovation and Invention.

SELECTED PUBLIC SOFTWARE

MIB Studio Qt — C++ · Qt · CMake · OpenCV. A scientific imaging application for acquisition, recording, review, and analysis, with reproducible release tooling and operator documentation.
https://github.com/gavinlouuu-kpt/mib-studio-qt

YOLO–SAM Cytometry Pipeline — Python · YOLO · SAM · Bokeh. Cell-detection and segmentation workflows that turn microscopy images into masks, morphology metrics, and interactive analysis.
https://github.com/gavinlouuu-kpt/yolo-sam-inference

YOLO–SAM Training — Python · PyTorch · MLflow. Reproducible training utilities for YOLO and Segment Anything models used in cytometry applications.
https://github.com/gavinlouuu-kpt/yolo-sam-training

Headspace VOC — Python · Physical chemistry. Utilities for preparing and calculating headspace volatile-organic-compound concentrations for gas-sensor experiments.
https://github.com/gavinlouuu-kpt/headVOC

M5 Gas Platform — C · ESP32 · Embedded sensing. An embedded acquisition platform for modular gas-sensor experiments and buffered data capture.
https://github.com/gavinlouuu-kpt/m5-gas-platform

TECHNICAL EXPERTISE

Domains: Biomedical engineering · Gas sensing · Breath analysis · Real-time deformability cytometry · Scientific machine vision · Project and grant management

Technical: Python · C and C++ · Qt · OpenCV · PyTorch · YOLO and Segment Anything · Embedded systems · Scientific instrumentation · GitHub Actions · Cloudflare Workers

Languages: English — native · Cantonese — native · Mandarin — native

PUBLIC EVIDENCE LINKS

Advanced Materials article: https://doi.org/10.1002/adma.202313935
HKSTP company directory: https://www.hkstp.org/directory/electronics/kings-phase-technologies-limited
CUHK startup profile: https://kto.cuhk.edu.hk/en/knowledge-transfer/discover-cuhk-startups/ketone-breathalyzer-king-s-phase-technologies
HKSTP Incubation Open Day showcase listing: https://www.linkedin.com/feed/update/urn:li:activity:7031154748686761985/
HKTDC Electronics Fair 2021 listing: https://exhmultifairs.hktdc.com/dm/2021/oct_fairs/efairdaily/issue_1.html
HKTDC Electronics Fair 2022 catalogue: https://exhmultifairs.hktdc.com/pdf/2022/oct_fairs/Fair_Catalogue/EFAE_eAsia.pdf
CUHK Engineering ENGAGE founder profile: https://engage.erg.cuhk.edu.hk/issue40/issue40.pdf
HKTDC NewsBites product feature:
https://sourcing.hktdc.com/newsbites/trend/7-tech-products-for-learning-entertainment-and-health-monitoring/
MAKE a DASH press coverage: https://hk.news.yahoo.com/5%E5%88%9D%E5%89%B5%E5%85%AC%E5%8F%B8%E7%8D%B2%E5%A4%A7%E7%81%A3%E5%8D%80%E7%87%9F%E6%A5%AD%E5%9F%B7%E7%85%A7-%E5%AD%B8%E7%A0%94%E9%96%8B%E7%99%BC%E5%91%BC%E5%90%B8%E5%88%86%E6%9E%90%E5%84%80%E6%B8%AC%E7%87%92%E8%84%82%E7%8E%87-104839755.html
RTHK documentary archive: https://edvideo.lib.eduhk.hk/tc/channels/rthk/series/fv1792085700?tab=videos
Sing Tao Daily founder profile: https://std.stheadline.com/daily/article/detail/2089816/
EMedIC Global 2021 booklet: https://www.bme.cuhk.edu.hk/emedic/EMedICGlobal2021_booklet_finalversion.pdf
HKSTP EPiC 2021 finalists: https://epic.hkstp.org/past-events/2021/global-finalists
HKSEC company profile: https://hksec.hk/wp-content/uploads/Book/KPT.pdf
2019 innovation and entrepreneurship competition results: https://www.cpr.cuhk.edu.hk/en/press/cuhk-wins-the-most-awards-in-hong-kong-university-student-innovation-and-entrepreneurship-competition-2019-among-local-institutions/
CUHK Bulletin, Most Outstanding Stars: https://www.iso.cuhk.edu.hk/images/publication/bulletin/201902/pdf/bulletin_201902_en.pdf
HKIAPS webinar programme: https://www.hkiaps.cuhk.edu.hk/wp-content/uploads/2023/08/E20220520-Programme.pdf