YuGang

An Interdisciplinary Explorer

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EDUCATION

M.Des in Information Art&Design 09/2021 - Excepted to 07/2024
Tsinghua University Beijing, China

- Supervisor: Prof. Yingqing Xu
- Research Area: Odor Computing, Human-computer Interaction
- GPA: 3.69/4.0

B.Eng. in Automation 09/2016 - 07/2021
B.Des in Product Design (Second Degree) 09/2016 - 07/2021
Tsinghua University Beijing, China

- Courses in CS, EE, mechanical engineering and product design
- Certification of Liberal Art Education

PAPER & PATENT

[1] Chen Y, Shen K, **Yu G**, et al. EEG Based Artistic Visualization of Dreams[C]//The Ninth International Symposium of Chinese CHI. 2021: 144-151.
[2] (Draft) Xu Y, **Yu G**, Sun Y, et al. Odor based cooking state recognition method[P]. Beijing (Invention Patent)
[3] (Draft) Xu Y, **Yu G**, Sun Y, et al. Odor recognition model training method and device[P]. Beijing (Invention Patent)
[4] **Yu G**, Li X,Gao P, et al. Itergrated Bathing Suits for Astronauts in Zero-g environment[P]. Beijing: CN216363721U, 2022-04-26. (Utility Model Patent)

RESEARCH

Precious Cook: Using an electronic-nose to monitor the cooking state of baking and roasting

I lead this research 02/2022 - Present

A 4-channel MOS gas sensor based electronic nose is applied in an oven to real-time monitor the cooking state of different recipies. This reseach is funded by a Chinese household appliance brand.

- **Sensory Evaluation User Experiement:** I invited 8 users to evaluate different cooking states based on vision, gustatory, olfactory and assessment scale.
- **Data Mining and On-chip Classification:** I used feature extraction and machine learning algorithms (e.g. SVM, XGBoost, ANN) to build a model running on ARM Cortex-M0+ MCU. The accuracy reached 90% for real-time tests.
- **Hardware Design:** I designed the gas path structure, chamber, and e-nose PCB, coping with up to 250°C/100%RH gas condition and under 6$ cost.
- **Sensor Calibration:** I evaluated the sensors including sensitivity, selectivity and lifespan and design calibration algorithms for better consistency.

Universal odor classification using electronic-nose

I lead this research 11/2021 - Present

This research investigates the universal ability of gas sensor arrays to smell and identify common odor substances, including beverage, food, VOCs, chemicals, etc.

- **53 Odor Substance:** Wine/beer/fruit juice/beaf/fish/methanol/ink/wood…
- **Commercial Release:** Early results were carried out on Cyberdog of Xiaomi Compny.

Human Exhaled Peculiar Odor Detection for Personal Care

I participate this research 07/2023 - Present

This project aims at developping a small and portable electronic nose device, to detect peculiar smells of exhaling. I am responsible for algorithm design.

Accessibility HCI: Voice Assistant for Blind People Using Smartphone

I am a major participater in this work 07/2020 - 10/2020

This research studies the intelligent voice agent to assist visually impaired people to browse mobile apps.

- Focusing on the user request and information feedback of list view
- Understanding the mental model through Wizard-of-Oz user experiments
- Application of NLP intention detection, entity annotation and Android development

WORK & INTERN

Tsinghua University, Beijing

Teaching Assistant 09/2022 - 12/2022

Undergraduate Counselor of Xinya College 08/2021 - 06/2022

LaTrobe University, Melbourne

Summer Research Intern 07/2019 - 09/2019

- Designed the Voice Artist interactive installation for Melbourne International Art Festival.

RETO Eco-solutions, Inc. Beijing

Product Designer 12/2018 - 06/2019

- Design patterns for interior wall tiles and outdoor square pavement.

Social Medicine Investigation Practice, Singapore

Team Member 07/2018 - 08/2018

- Conduct research on public and private healthcare institutions in Singapore.

AWARDS

- 2022 Tsinghua University Comprehensive Excellence Scholarship (Second Class)
- Team Second Prize of Intelligent Car Competition, School of Vehicle and Mobility, Tsinghua University

SKILLS

- Human-computer Interaction: User Research, Observation, UI Design, Wizard-of-Oz
- Coding & Machine Learning: Python, C/C++, Sklearn, Pytorch, Embedded Development
- Mechenical Design: Solidworks, 3D printing, Keyshot
- Electronic Hardware Design: Altium Designer