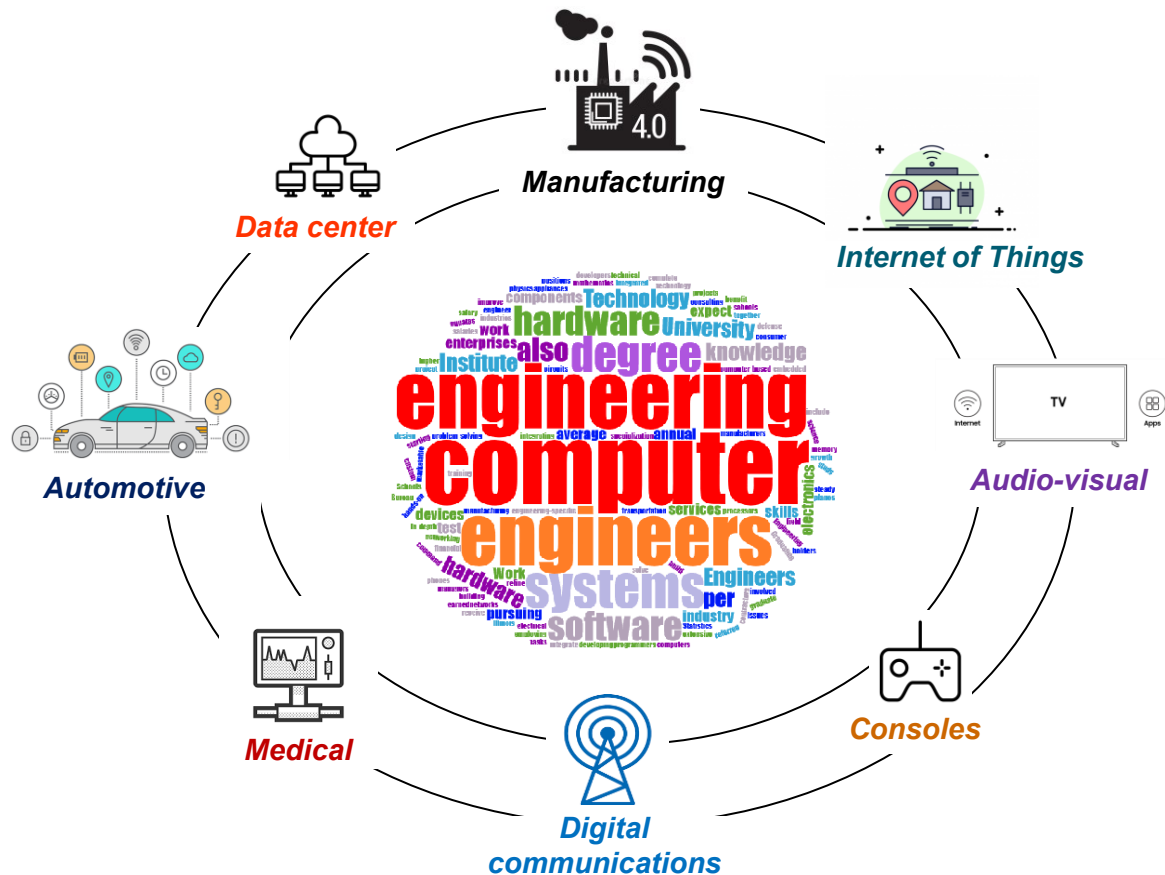# Student orientation

Studying ECE @ VNU-UET

Hoang Gia Hung

Faculty of Electronics and Telecommunications

University of Engineering and Technology, VNU Hanoi

Program vision

❑ To prepare all students for a successful career in an **ever-changing** field incorporating **software** & **hardware** engineering design.

Manufacturing

Data center

Internet of Things

Automotive

Audio-visual

Medical

Consoles

Digital communications

The program mission

❑ Provide students with high-quality education that produces young Professionals with strong academic and technical backgrounds.

➢ Fusion of **computer science** and **electrical engineering**
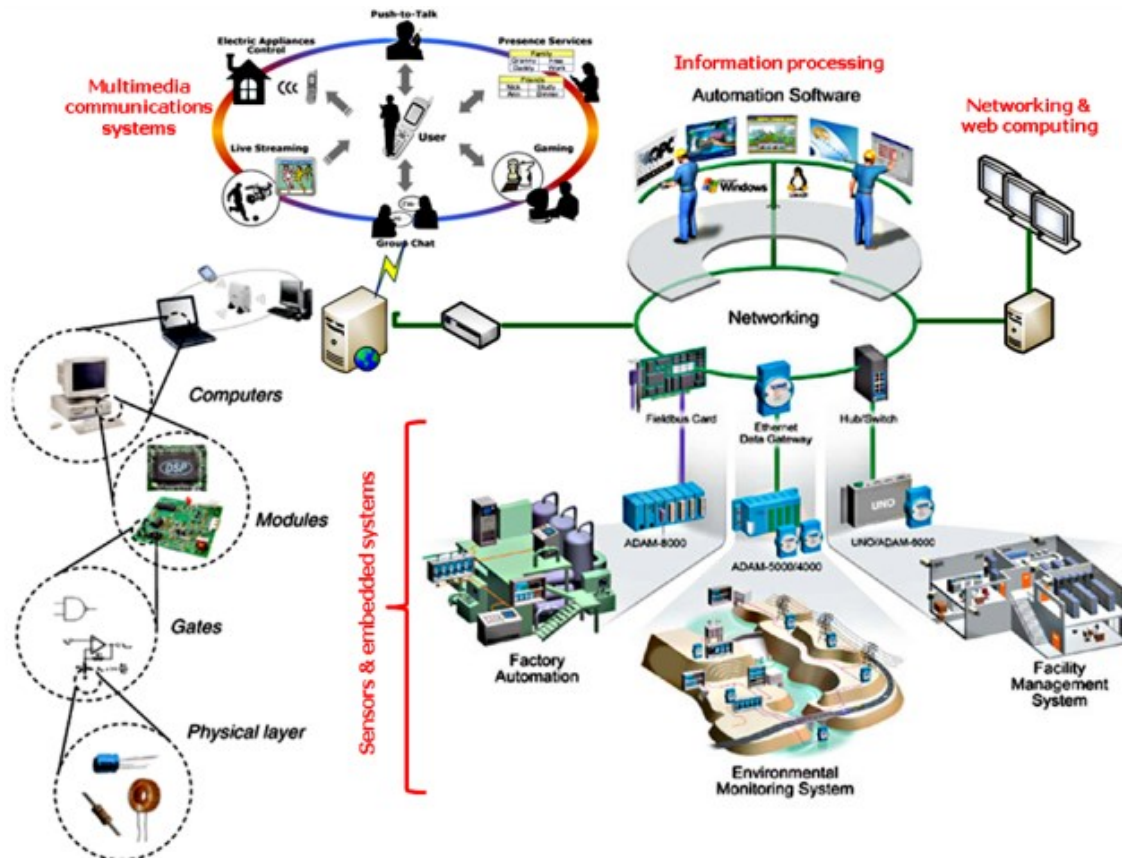
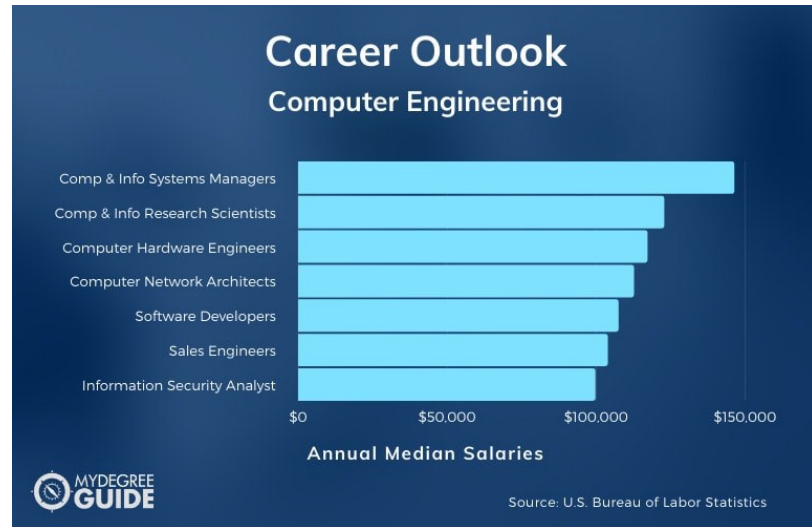# ECE career outlook

❑ US job market statistics

❑ Potential local employers

Program design

❑ **Pre-core subjects**

➢ Mathematical foundations (linear algebra, calculus, statistics)

➢ Introduction to ECE (electrical & computer)

❑ **Core subjects**

➢ **Fundamentals of electrical engineering**: electronic devices & circuits (analog), digital logic

➢ **Fundamentals of computer science**: Data structures & algorithms, introduction to programming & software engineering

➢ **Signal transmission & processing**: signals & systems, digital signal processing, digital communications, controlled systems, computer networks

❑ **Depth and breadth**

➢ **Computer systems**: VLSI design, computer architecture, microprocessors

➢ **System programming**: Principles of compiler & operating system

➢ **HW-SW co-design**: embedded systems/system on chips

➢ **Application-oriented electives**: automotive, multimedia, robotics, IoT, …

Core skillset

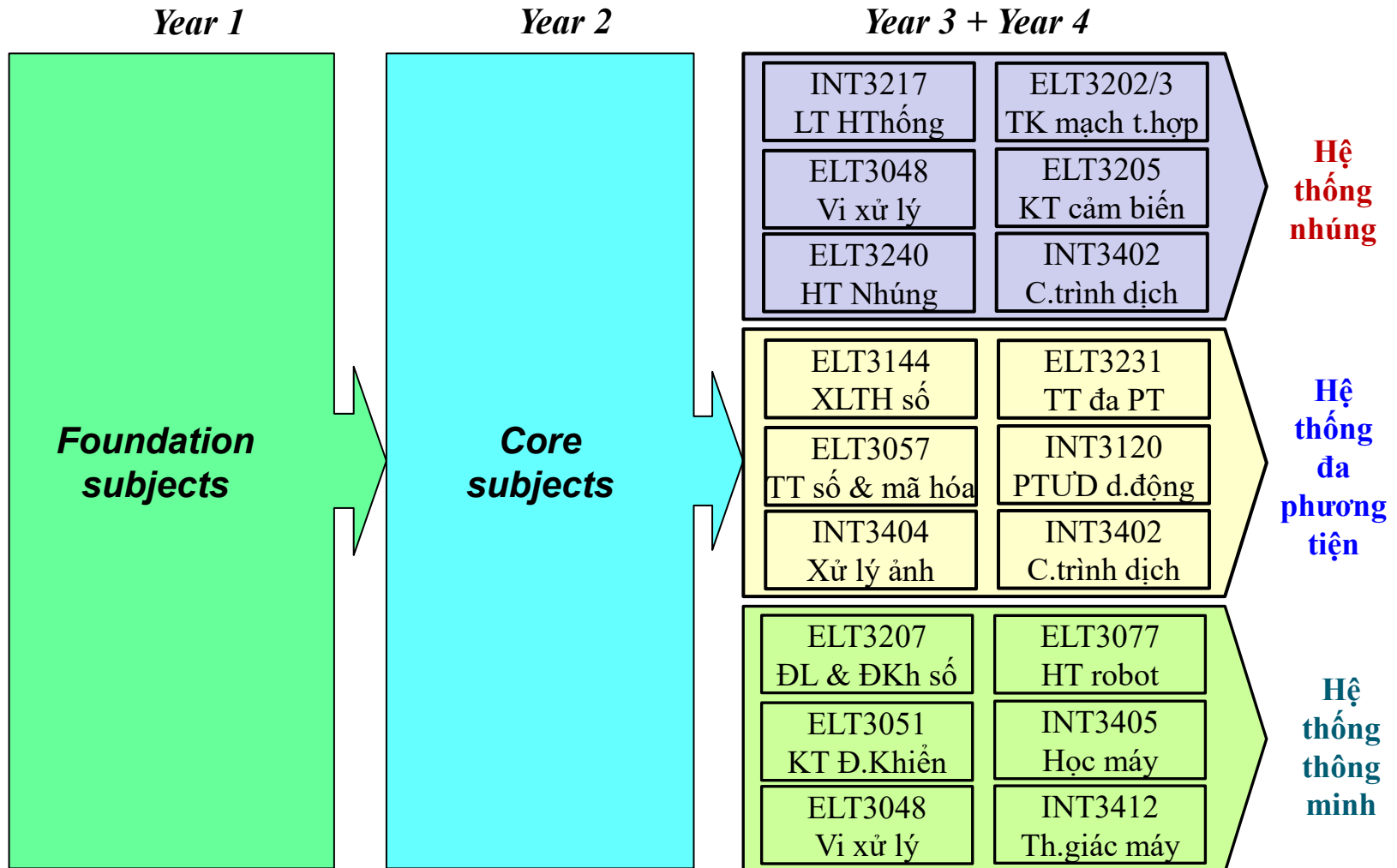| Application Software | >"hello world!" | Programs | → Programming (data structures, algorithms) |

System programming (drivers, kernel,…)

Computer organization and architecture (ISA design & implementation)

Embedded systems (HW/SW co-design)

Digital design (HDL, Integrated circuits)

Analog electronics

Semiconductor devices

Operating Systems — Device Drivers

Architecture — Instructions Registers

Micro-architecture — Datapaths Controllers

Logic — Adders Memories

Digital Circuits — AND Gates NOT Gates

Analog Circuits — Amplifiers Filters

Devices — Transistors Diodes

Physics — Electrons

Application fields: Multi-media processing, Digital control, Robotics, …

Specialization: typical examples

Year 1

Year 2

Year 3 + Year 4

Foundation subjects

Core subjects

INT3217 LT HThống	ELT3202/3 TK mạch t.hợp
ELT3048 Vi xử lý	ELT3205 KT cảm biến
ELT3240 HT Nhúng	INT3402 C.trình dịch

Hệ thống nhúng

ELT3144 XLTH số	ELT3231 TT đa PT
ELT3057 TT số & mã hóa	INT3120 PTƯD d.động
INT3404 Xử lý ảnh	INT3402 C.trình dịch

Hệ thống đa phương tiện

ELT3207 ĐL & ĐKh số	ELT3077 HT robot
ELT3051 KT Đ.Khiển	INT3405 Học máy
ELT3048 Vi xử lý	INT3412 Th.giác máy

Hệ thống thông minh

People @ ECE

❑ Office: R. 702, E3 Building, 144 Xuân Thủy

  ➢ http://fet.uet.vnu.edu.vn/bo-mon-dien-tu-va-ky-thuat-may-tinh/

❑ People

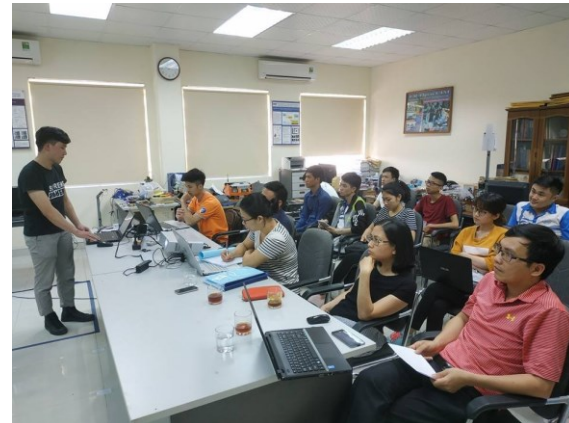Prof.Bạch Gia Dương   Dr. Hoàng Gia Hưng   Dr. Nguyễn Kim Hùng   Dr. Phạm Đức Quang   Dr. Phạm Duy Hưng   MSc. Phạm Đình Tuân

Research directions
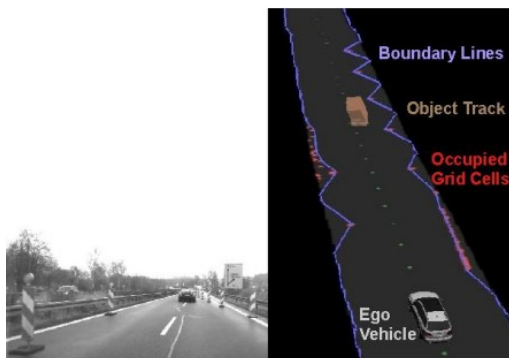
❑ Swarm robot (Dr. Phạm Duy Hưng)

Đa robot phối hợp bao phủ, giám sát môi trường có cấu trúc

❑ Chip design & IoT applications (Dr Nguyễn Kim Hùng)

❑ Interdisciplinary research (Dr. Hoàng Gia Hưng, Dr. Phạm Đức Quang, …)

❑ RF electronics (Prof. Bạch Gia Dương)

International collaboration

❑ Australia

❑ Canada

❑ Japan

❑ United States of America

Discussion

❑ Any questions?