Introduction to the courses of Mobile Internet and Digital Media Technology, HIT/CS

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2021年3月12日星期五

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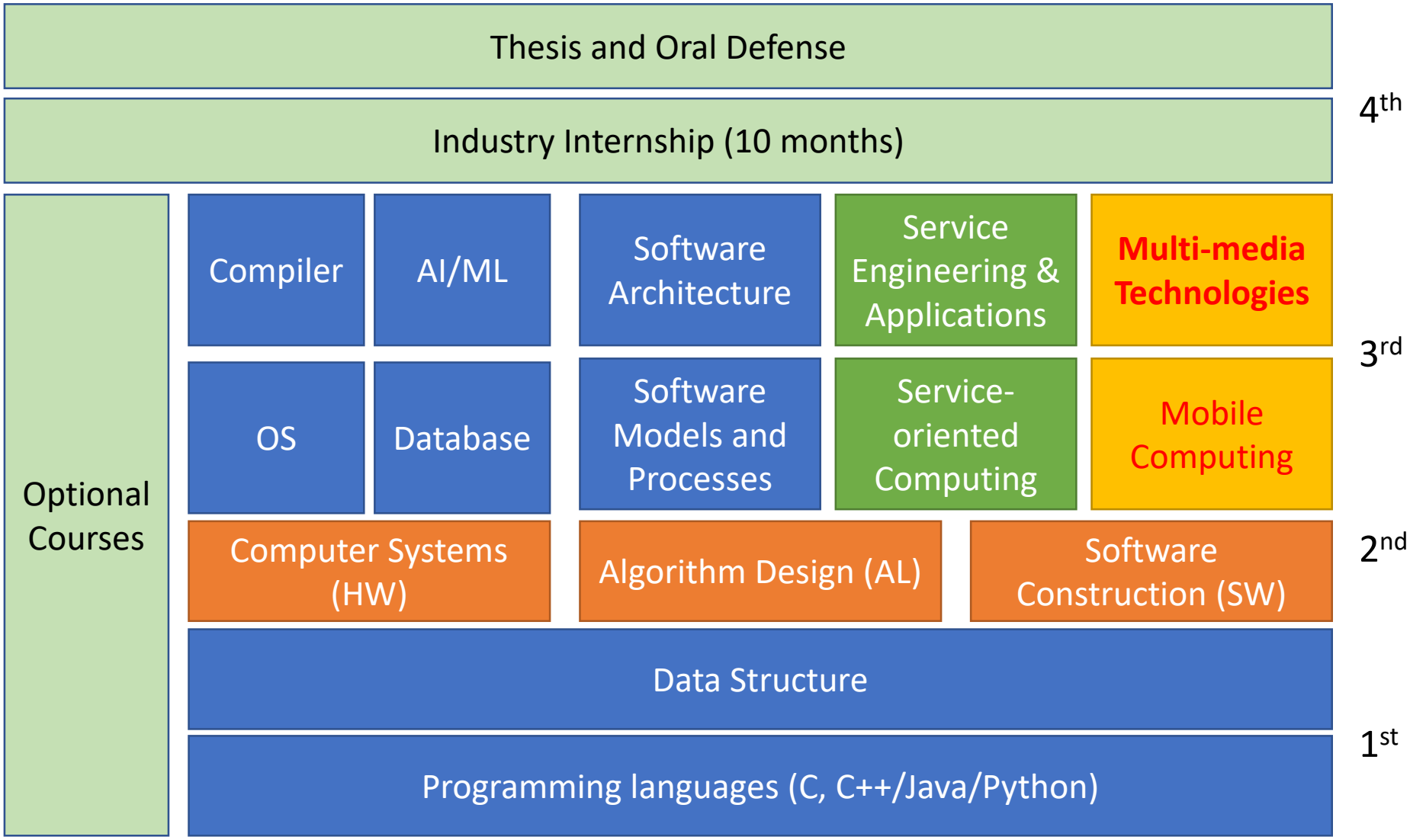
Undergraduate Courses



Software Architecture

Software Models and Processes

Service Engineering & Applications

Service-oriented Computing

Multi-media Technologies

Mobile Computing

Fundamental Software Development Technologies + Internet-Oriented Applications

General Software Development

Innovation, Requirement, Architecture, Design, Testing, Operation

Marketing, Product Manager, Requirement Engineer, Architect, Designer, Testing Engineer, Operation Engineer

Internet Services Development

Innovation, Requirement, Architecture, Design, Testing, Operation

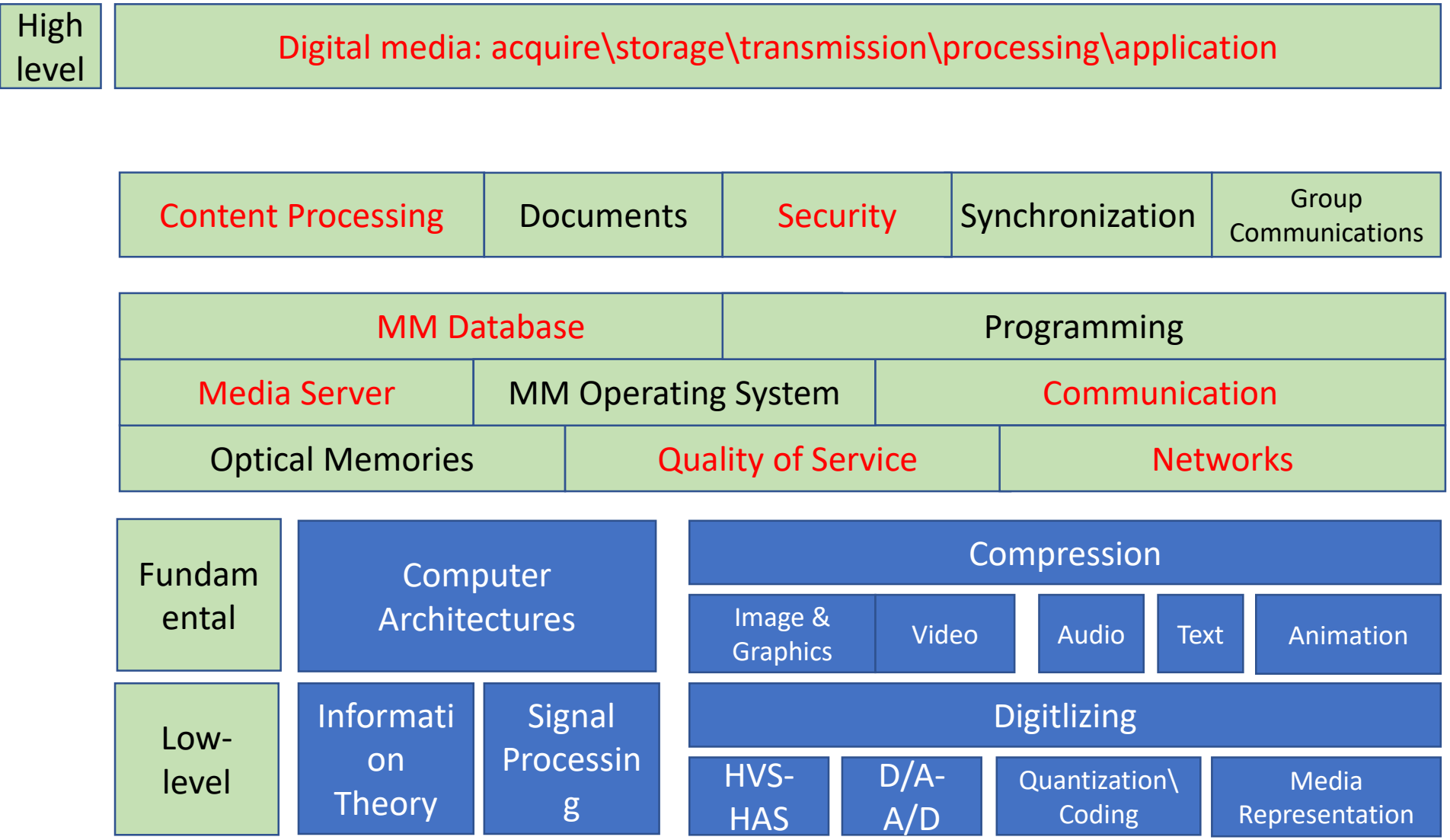
Marketing, Product Manager, Requirement Engineer, Architect, Designer, Testing Engineer, Operation Engineer

Mobile and Multi-media Services Development

Innovation, Requirement, Architecture, Design, Testing, Operation

Marketing, Product Manager, Requirement Engineer, Architect, Designer, Testing Engineer, Operation Engineer

Undergraduate Courses



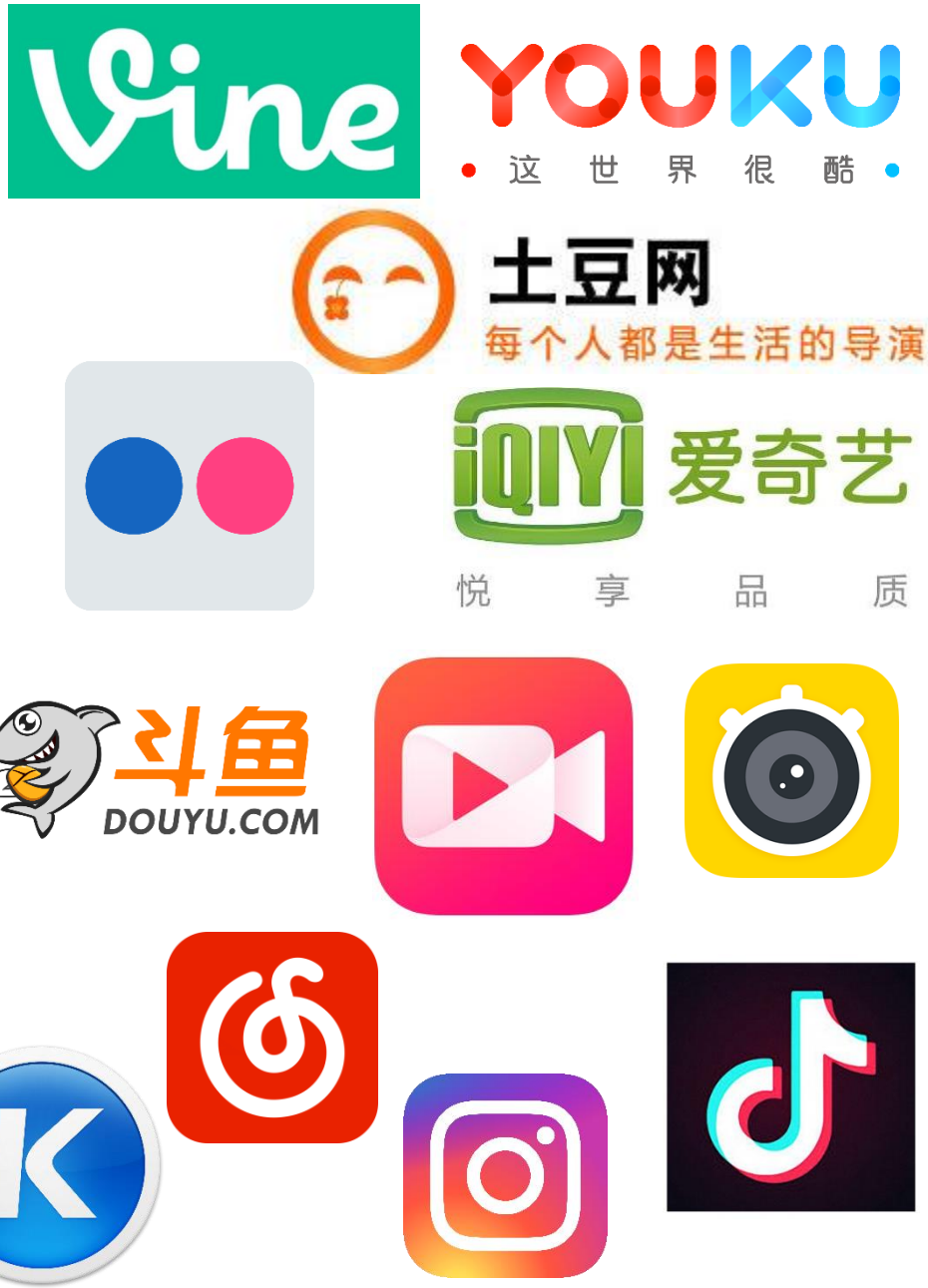
Why are we focused on “Internet Services”?

Why are we focused on "Mobile and Multi-media Services"?

More and more services are delivered to users in the form of **sounds, voices, pictures, and videos** via channels of **mobile terminals**.

- **Digital media system**: fundamental components
- **Key technologies**: Acquisition, compression, storage, processing, searching, analysis and delivery
- **Performance-oriented software design**
- **Domain-specific applications**

- Fundamental **mathematical theory**
- Basic **algorithms**
- Open source **repositories** and **toolkits**
- **Case studies**

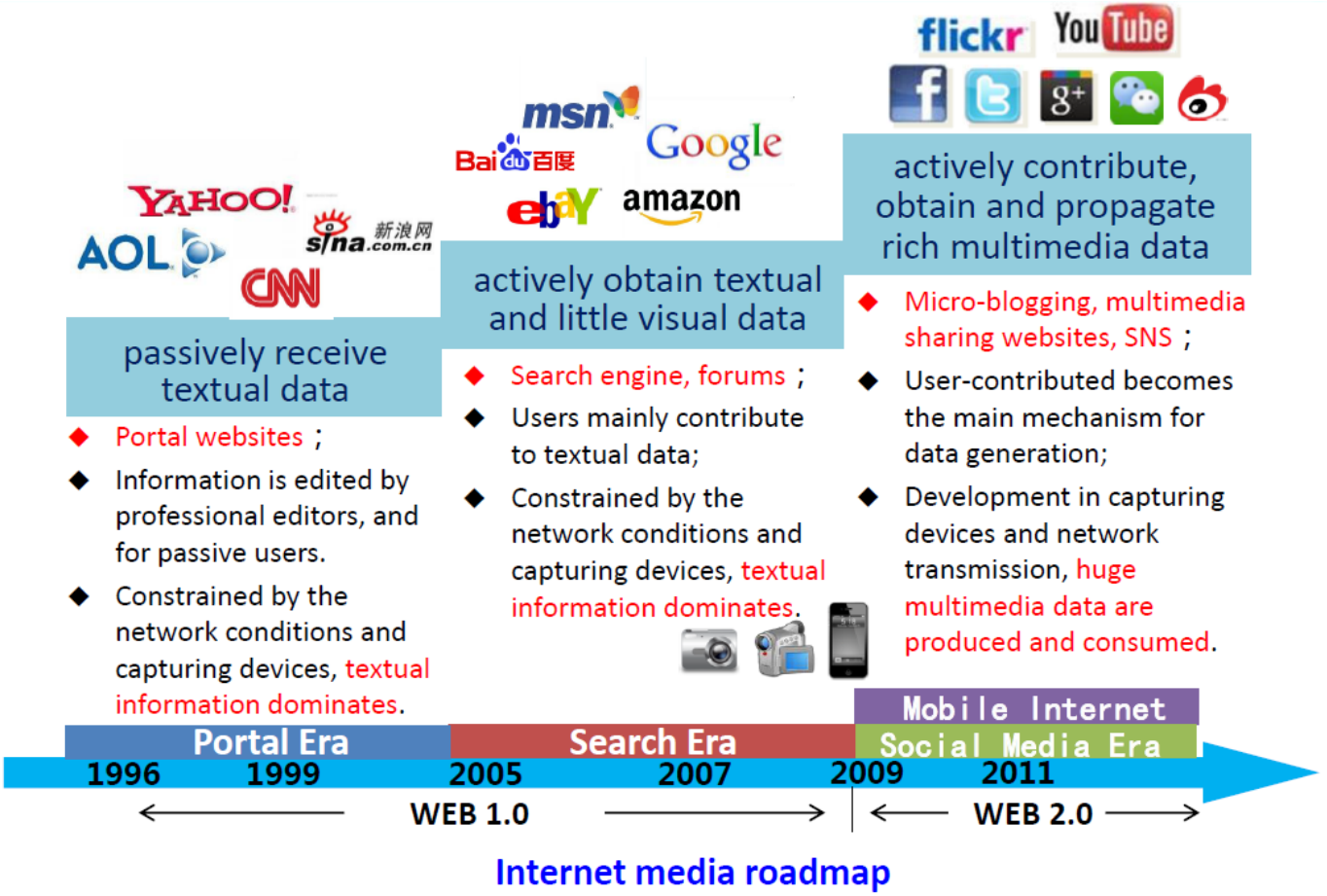


Multimedia Data

- **Multimedia data, such as digital images, audio streams, motion video programs, etc, exhibit much richer structures than simple, isolated data items.**
  - How to particularly powerful and effective modeling multimedia data
  - How to do common tasks of multimedia content analysis
  - When facing new technologies, for example, deep learning, how to understand the underlying story!

Compact Representation

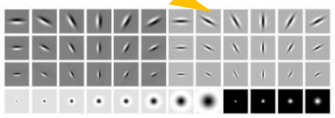
- **Compact Representation**

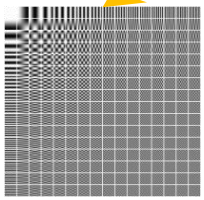


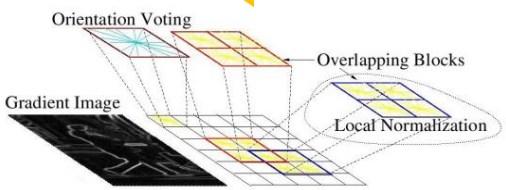
Internet media roadmap

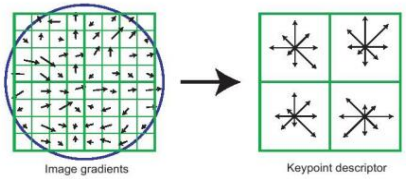
Compact Representation

- **Removing redundancy**
- **Collaborative hierarchical feature representation for variant applications**









Classification: Learning-based

Compression: DCT features

Object detection: HOG features

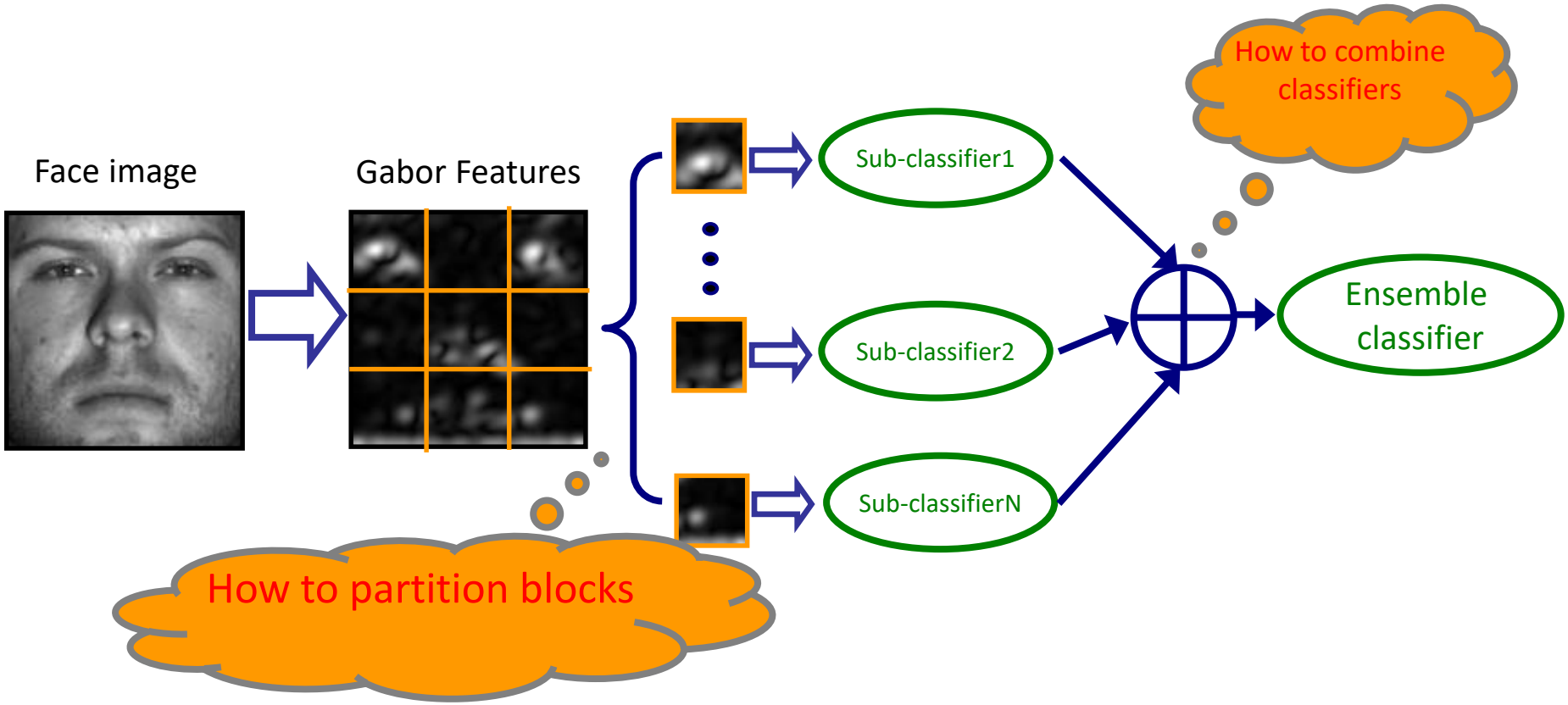
Media Retrieval: SIFT features

Content of Mobile Internet and Multimedia

- The basic concepts, mathematical foundations, professional methods, techniques, and theories for multimedia Signal Processing, especially on Internet
- The basic A/D, representation, and latest techniques and methods for multimedia applications
- Strengthening the students' practical skills for both fundamental research and project development.
- And cultivating the ability to apply engineering fundamentals and professional knowledge to solve complex engineering problems
- Also improving their awareness and habits of self-learning, lifelong learning and research interests

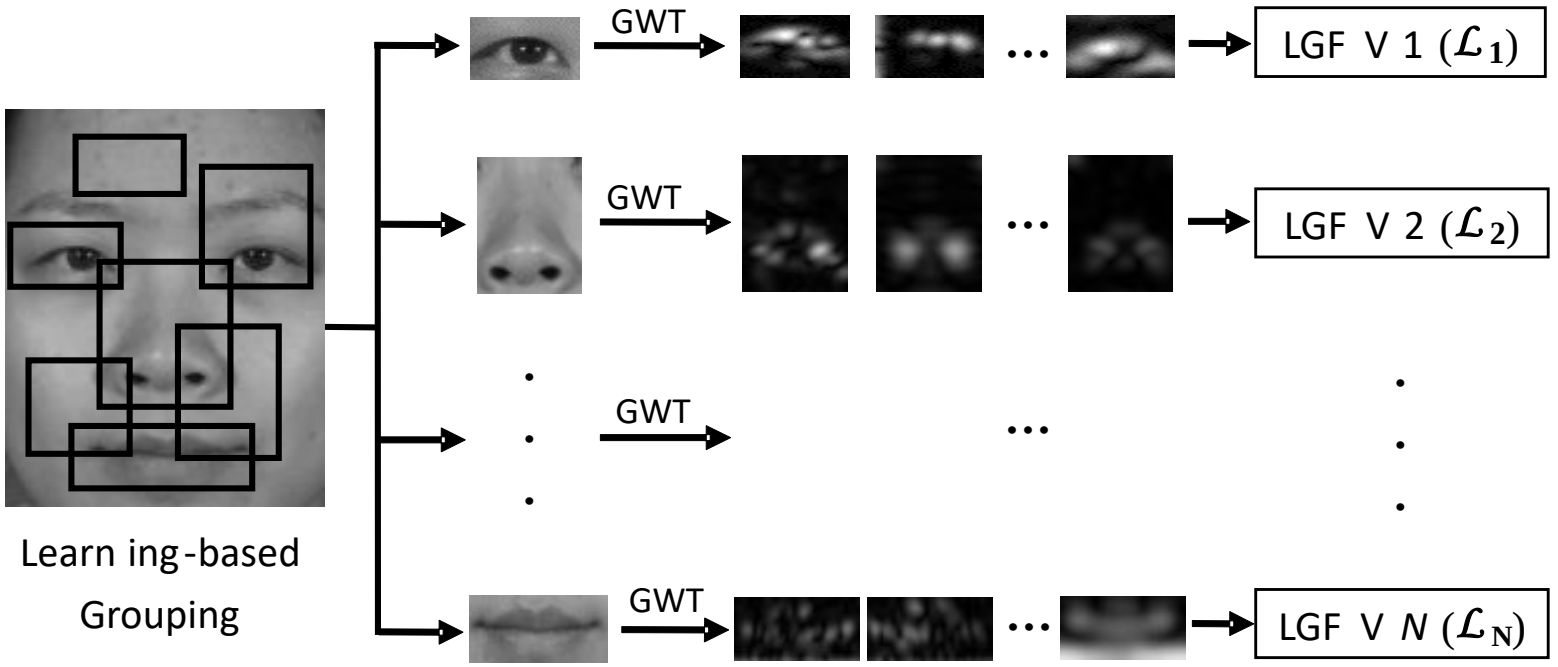
Classical Methodology

- Classical Methodology



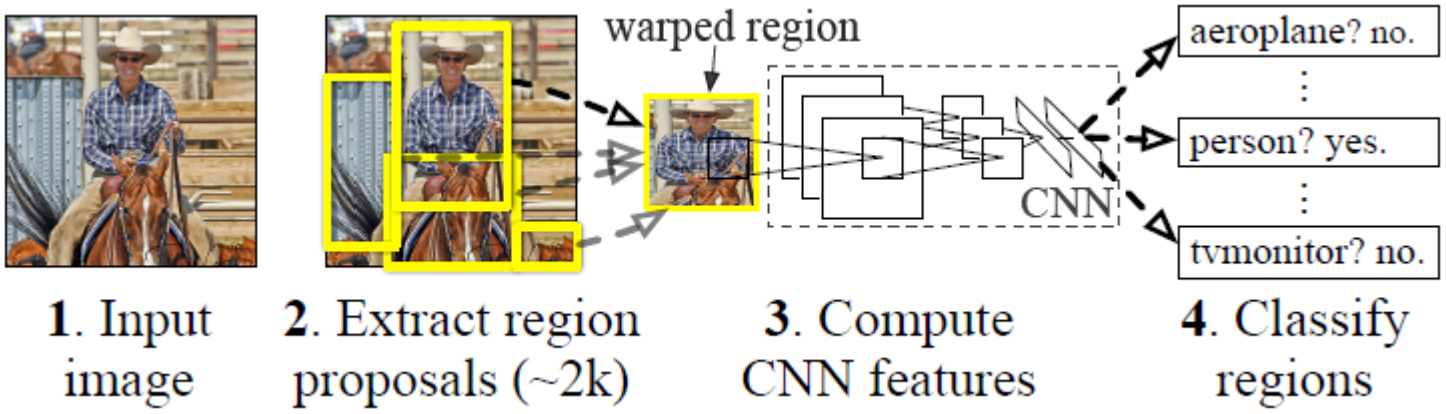
Filters

- Basic pipeline



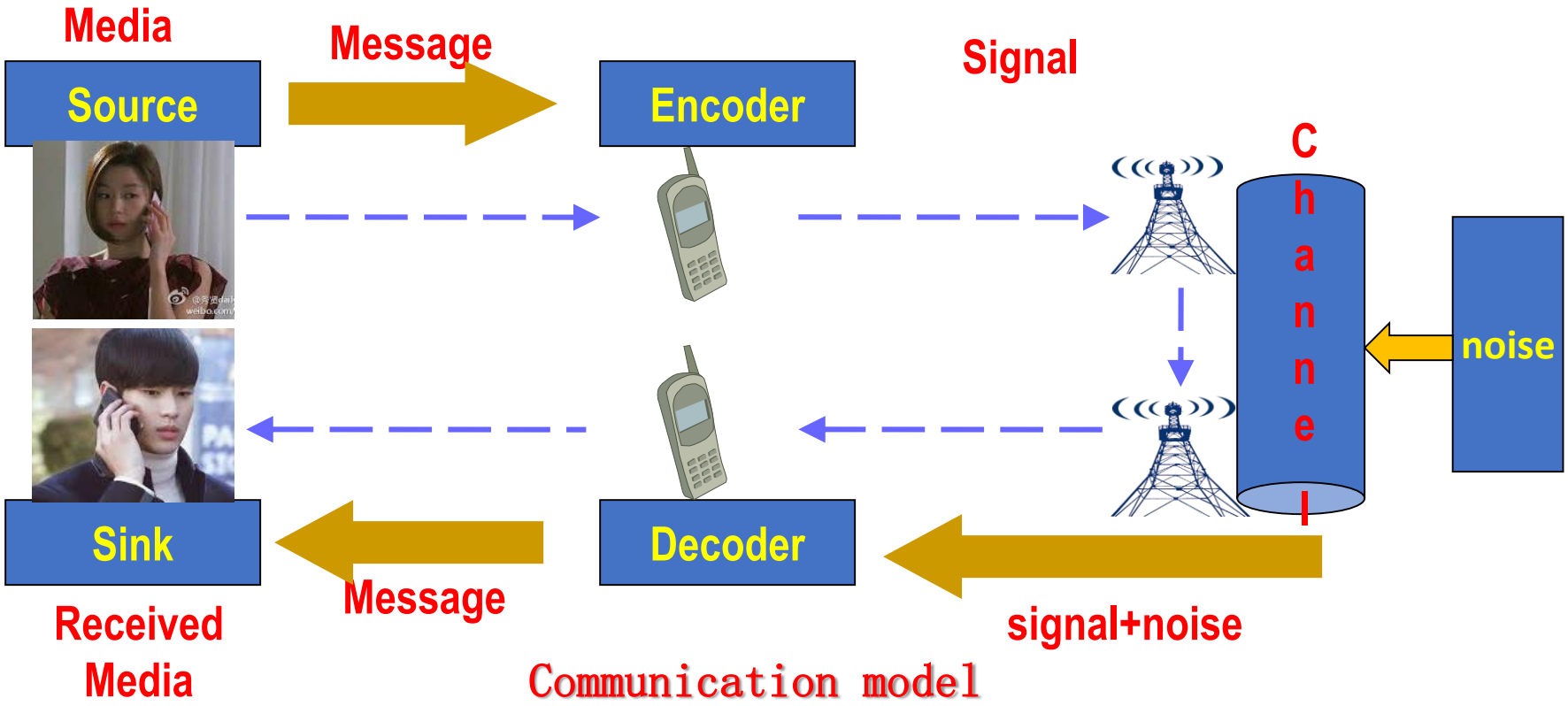
Deep learning based Methods: R-CNN

- Two-stage, proposal-driven mechanism
  - The first stage generates a sparse set of candidate object locations
  - the second stage classifies each candidate location as one of the foreground classes or as background using a cnn



This two-stage framework consistently achieves top accuracy on the challenging COCO benchmark

Basic communication model



Communication model

Thank You

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March 12, 2021