

# Introduction to Software Engineering

Jin Guo  
SOCS McGill University

# Reminder

Please complete within today

- Background Survey
  - Team formation
- Topic Preference
  - Present materials and lead discussion
  - Join Slack (dbis-mcgill-fall2021.slack.com)

# Software Engineering

an engineering discipline that is concerned with all aspects of software production from initial conception to operation and maintenance.

# Software Applications



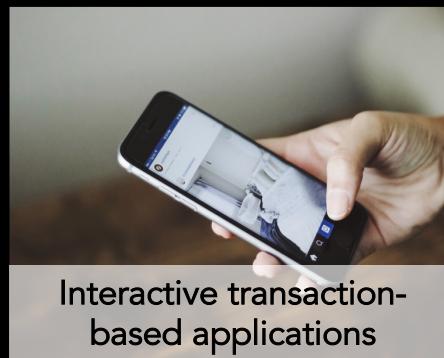
Embedded control systems



Stand-alone applications



Entertainment systems



Interactive transaction-based applications

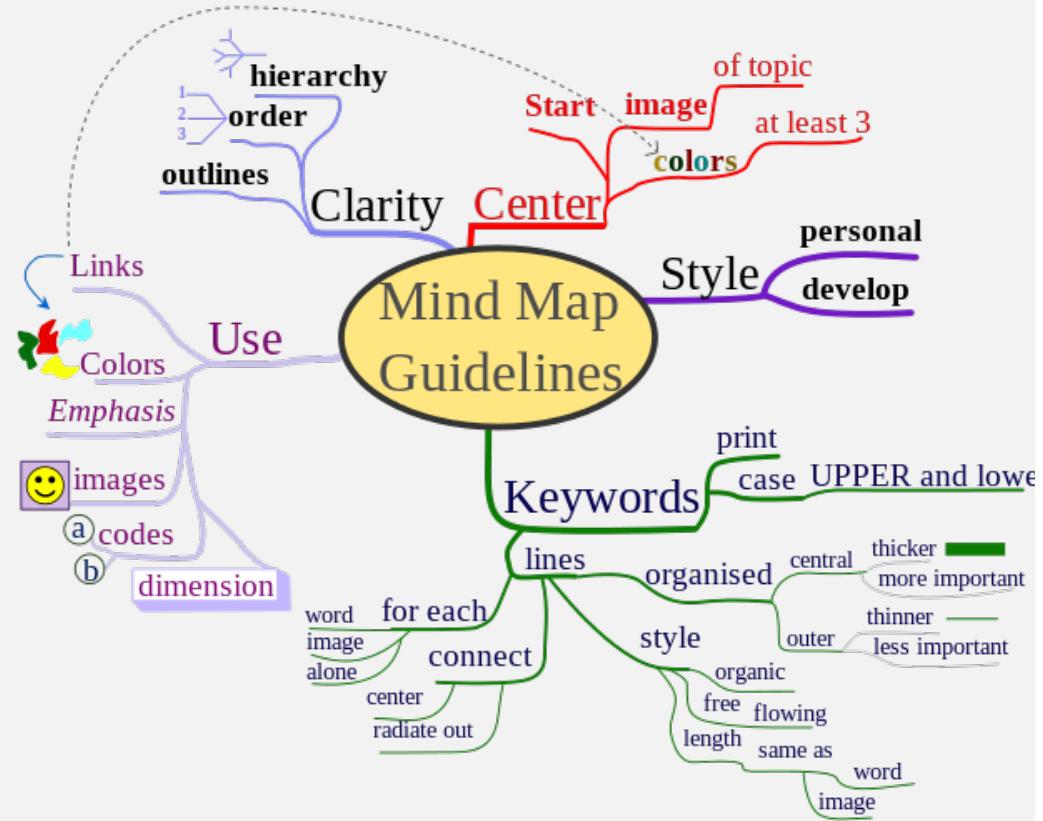


Systems of Systems



# Activity 1

- Choose one software type and one concrete application from that type.
- List five key quality considerations for the application you choose.
- Draw a mind-map to organize the considerations and add related concept to explain the attributes.

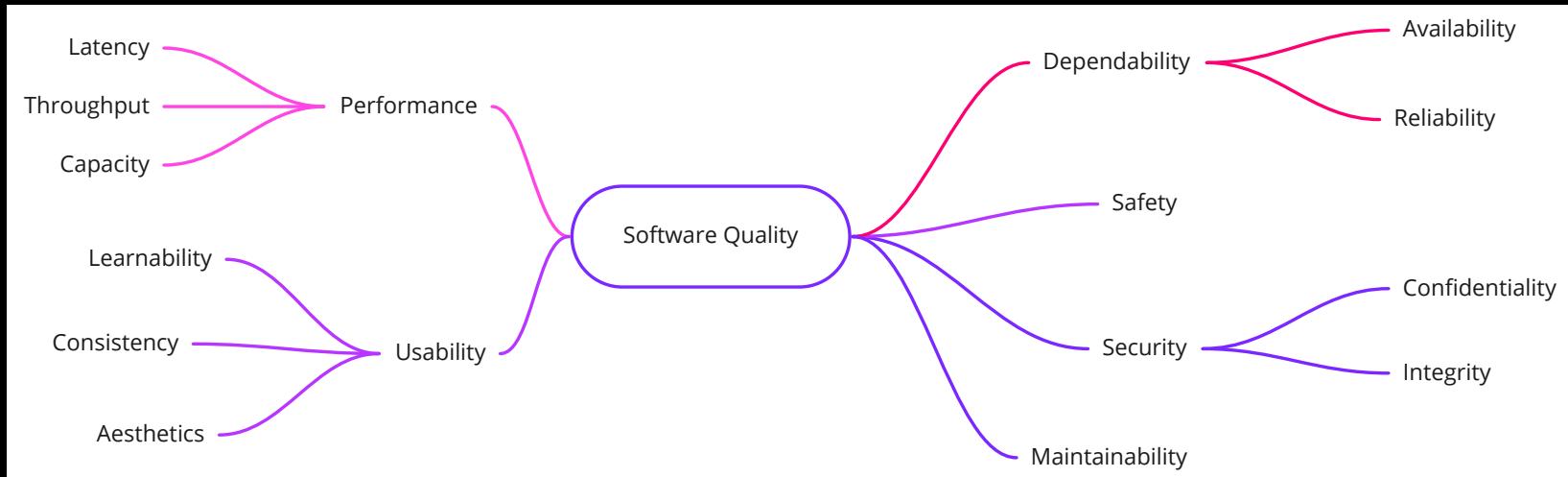


Mind-map by [Nicoguaro](#) on [Wikipedia](#)

# Quality Attributes

What's missing?

- Relations between some attributes
- Methods to achieve those attributes
- Values that can be delivered



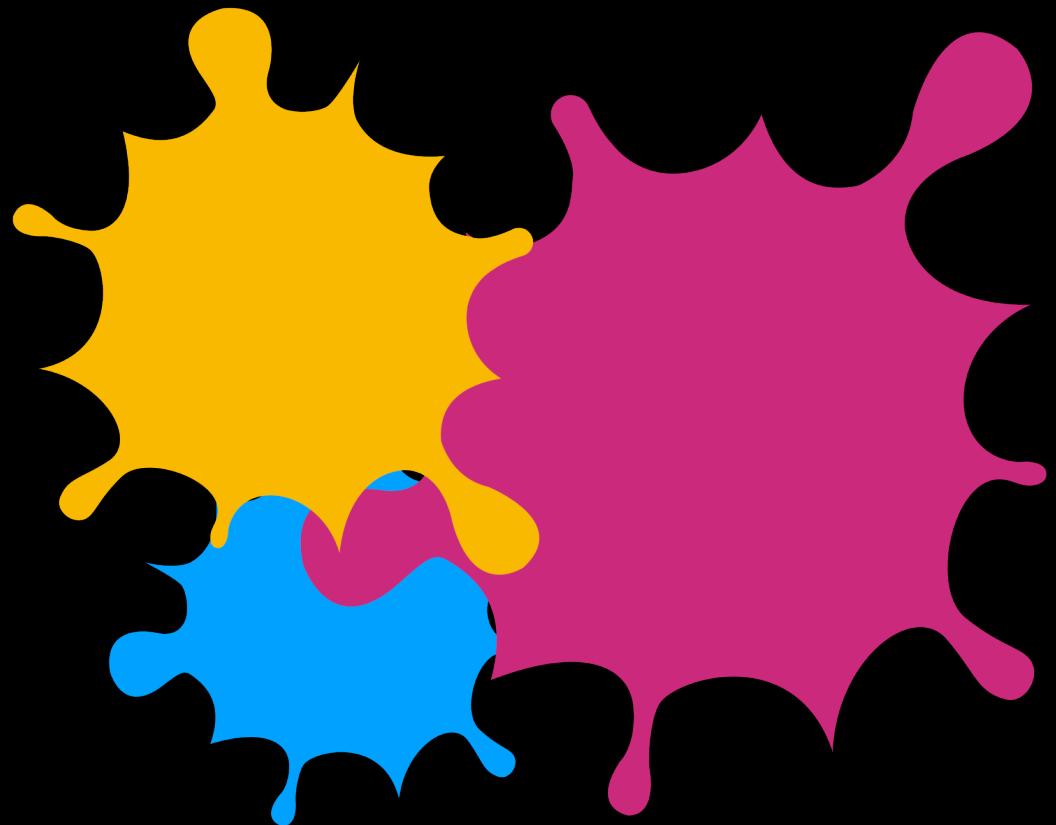
# Foundational Software Activities

- Write down the software activities you know or have participated.
- Do they fall into those categories?
  - specification, design and implementation, validation and evolution
  - If not, where is it situated?

# Activity 2

---

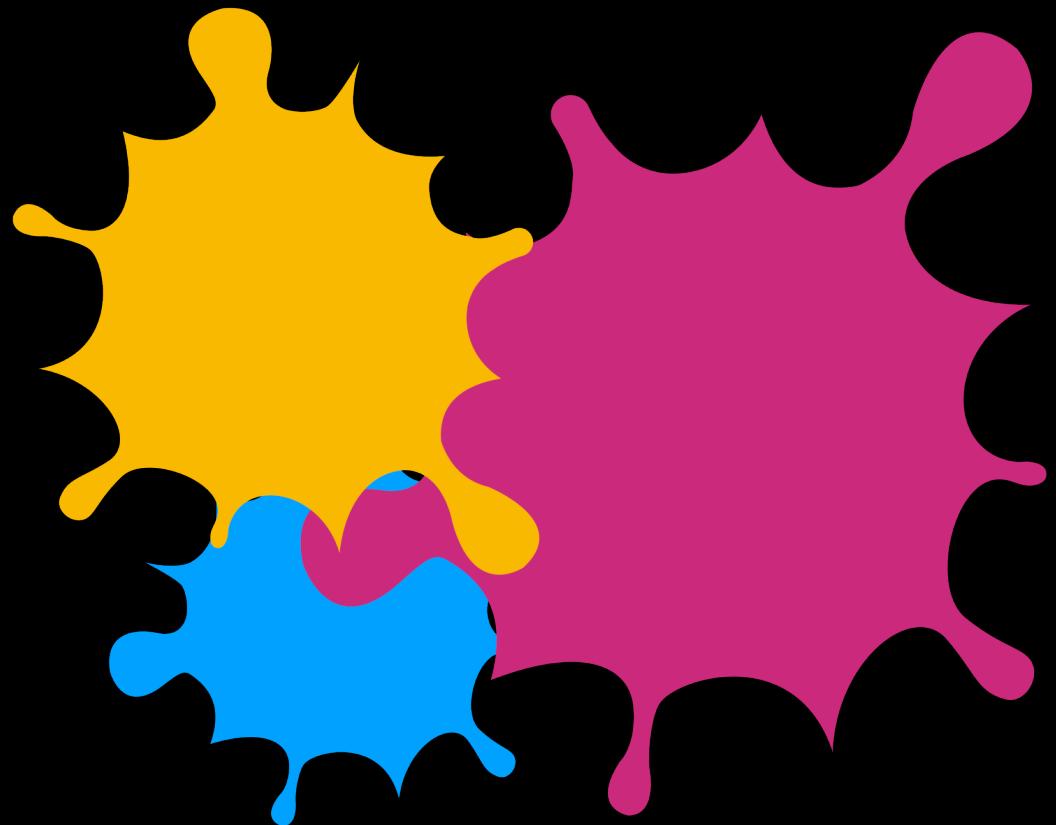
- Two round of Pictionary
  - 2 mins each
- Roles in each group
  - Drawer: no numbers nor letters
  - Timer: control and record the time
  - Guesser: guess the word



# Activity 2

---

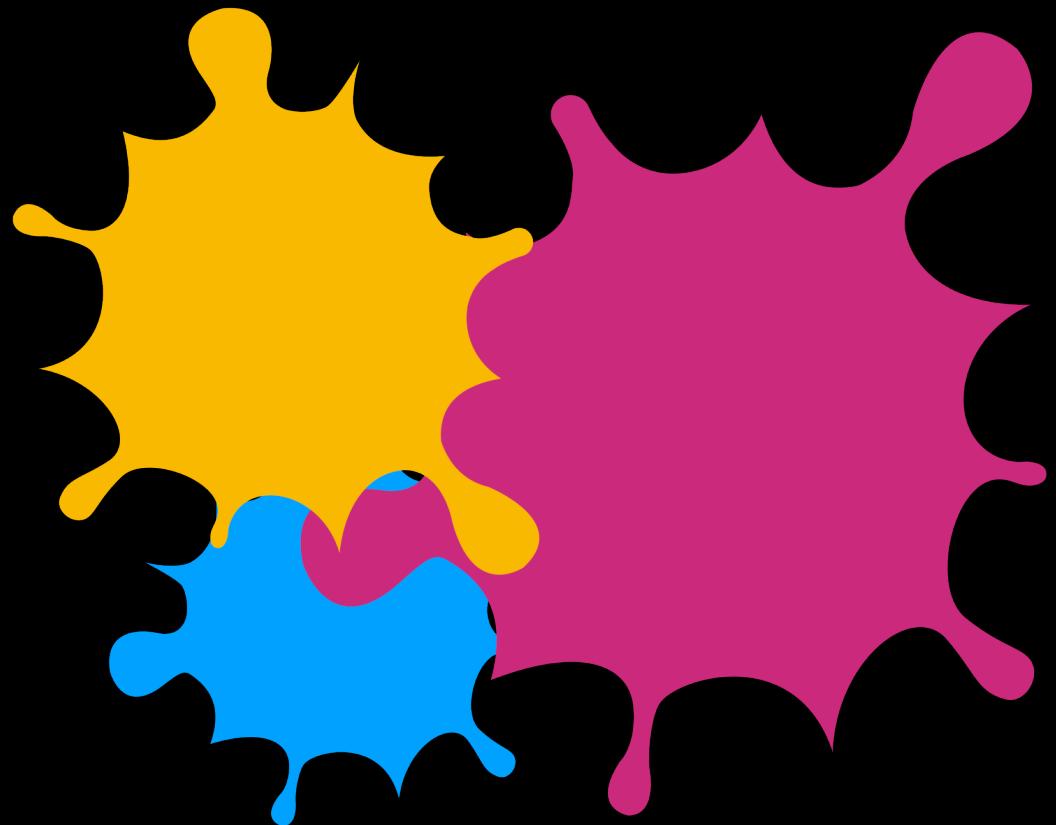
- First round
  - 1.5 mins drawing (no interaction)
  - 30 sec guessing
- Second round
  - 2 mins drawing and guessing



# Activity 2

---

- Discuss
  - Which rule works better?
  - What are the challenges for drawer?
  - What are the challenges for guesser?



# Agile Software Development

## The Agile Manifesto

We are uncovering better ways of developing software by doing it and helping others to do it. Through this work, we have come to value:

**individuals and interactions** over processes and tools;

**working software** over comprehensive documentation;

**customer collaboration** over contract negotiation;

**responding to change** over following a plan.

While there is value on the items on the right, we value the items on the left more.

# Example Agile Frameworks

- Scrum

<https://www.agilealliance.org/glossary/scrum/>

- Extreme Programming

<https://www.agilealliance.org/glossary/xp/>

# Activity 3

---

- Within the group:
  - Investigate the key practices in each framework. (10 mins)
    - What are they
    - What values do they contribute to?
  - Explain to the whole class as a group
  - Think about the how it is done in different framework.

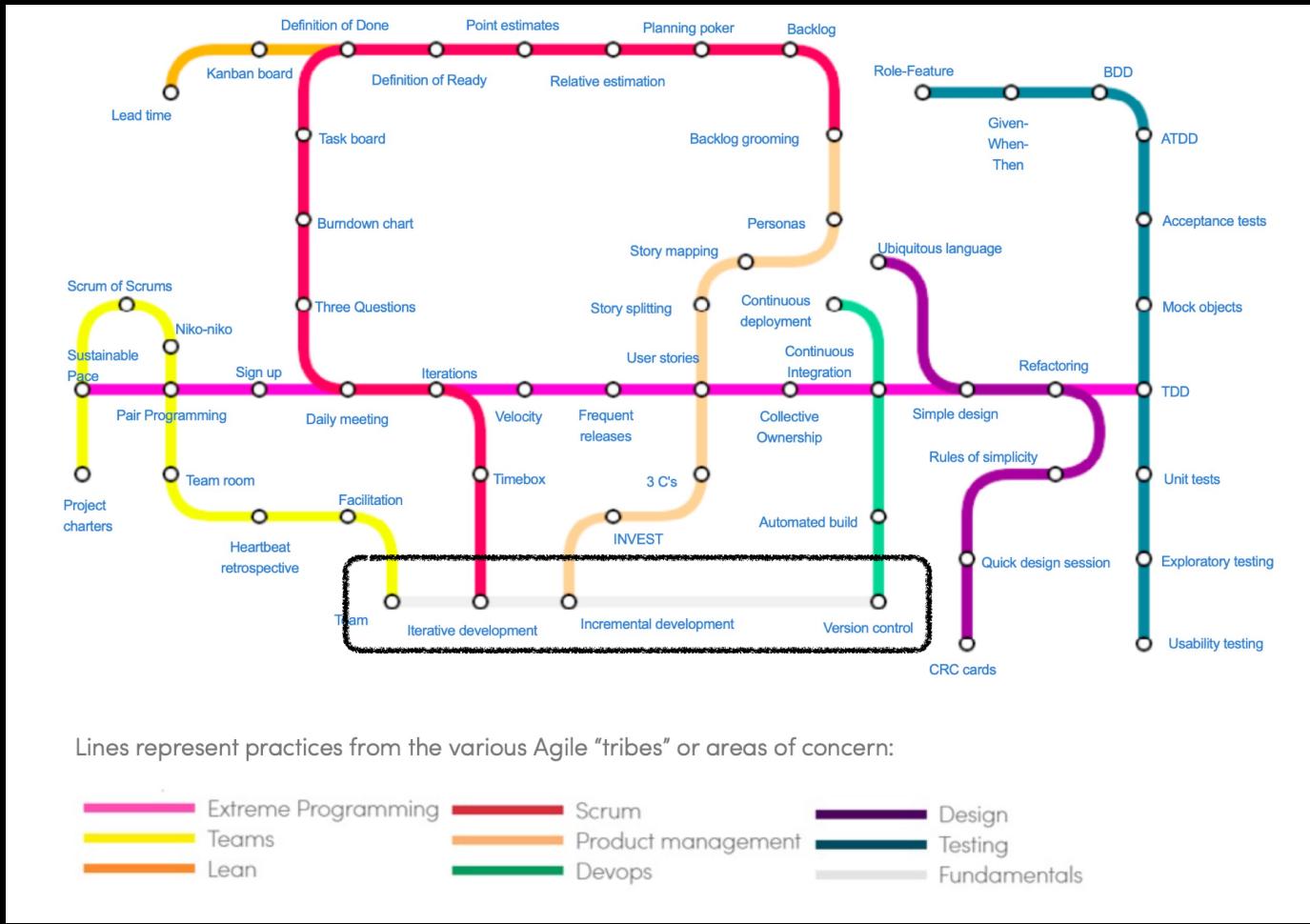


Image Credit: <https://www.agilealliance.org/agile101/subway-map-to-agile-practices/>

# Software Engineering Ethics

## Code of Ethics

IEEE-CS/ACM Joint Task Force on Software Engineering Ethics and Professional Practices

1. PUBLIC – Software engineers shall act consistently with the public interest.
2. CLIENT AND EMPLOYER – Software engineers shall act in a manner that is in the best interests of their client and employer consistent with the public interest.
3. PRODUCT – Software engineers shall ensure that their products and related modifications meet the highest professional standards possible.
4. JUDGMENT – Software engineers shall maintain integrity and independence in their professional judgment.
5. MANAGEMENT – Software engineering managers and leaders shall subscribe to and promote an ethical approach to the management of software development and maintenance.
6. PROFESSION – Software engineers shall advance the integrity and reputation of the profession consistent with the public interest.
7. COLLEAGUES – Software engineers shall be fair to and supportive of their colleagues.
8. SELF – Software engineers shall participate in lifelong learning regarding the practice of their profession and shall promote an ethical approach to the practice of the profession.

# Ethics For Computing professionals

## Code of Ethics

### ACM Code of Ethics and Professional Conduct

#### General Principles

- 1.1 Contribute to society and to human well-being, acknowledging that all people are stakeholders in computing.
- 1.2 Avoid harm.
- 1.3 Be honest and trustworthy.
- 1.4 Be fair and take action not to discriminate.
- 1.5 Respect the work required to produce new ideas, inventions, creative works, and computing artifacts.
- 1.6 Respect privacy.
- 1.7 Honor confidentiality.

# Ethics For Computing professionals

## Code of Ethics

### ACM Code of Ethics and Professional Conduct

#### Professional Responsibilities

- 2.1 Strive to achieve high quality in both the process and products of professional work.
- 2.2 Maintain high standards of professional competence, conduct, and ethical practice.
- 2.3 Know, respect, and apply existing rules pertaining to professional work.
- 2.4 Accept and provide appropriate professional review.
- 2.5 Give comprehensive and thorough evaluations of computer systems and their impacts, including analysis of possible risks.
- 2.6 Have the necessary expertise, or the ability to obtain that expertise, for completing a work assignment before accepting it. Once accepted, that commitment should be honored.
- 2.7 Improve public awareness and understanding of computing, related technologies, and their consequences
- 2.8 Access computing and communication resources only when authorized to do so.
- 2.9 Design and implement systems that are robustly and usably secure

# To-do

- Background Survey
- Topic Preference
- Join Slack (dbis-mcgill-fall2021.slack.com)
- Readings from the syllabus

See you on Tuesday