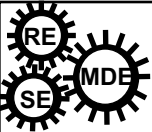# Unified Modeling Language

(A Brief Overview)

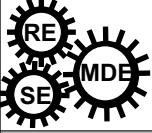CSE870: Advanced Software Engineering (Cheng): UML Overview

1

Types of Diagrams

Objectives: visualize, specify, construct, and document a system

- **Structural**: focus on static aspects of system

- **Behavioral**: focus on dynamic aspects of system (changing parts)

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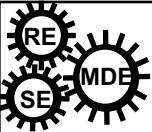
2

Structural Diagrams

- **Class**: set of classes and their relationships
  - Interface: is a collection of operations that specify a service of a class
- **Object:** set of objects and their relationships
- **Component:** set of components and their relationships
  - component:physical realization of a logical grouping of elements (e.g., classes, interfaces)
- **Deployment:** set of nodes and their relationships
  - exists at run time; represents computational resource
  - node typically encloses one or more components
- **Package:** collection of related UML entities (e.g., classes, interfaces), put together for readability/abstraction

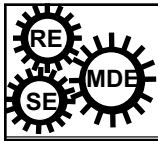CSE870: Advanced Software Engineering (Cheng): UML Overview

3

Behavioral Diagrams

- **Use case**: organize behaviors of system
  - user goals (high-level services of system)
  - perspective from external entities (actors)
- **Interaction Diagrams**
  - **Sequence:** focus on time ordering of messages
  - **Collaboration**: focus on structural organization of objects that send/receive messages
- **Statechart:** changing state of system driven by events
- **Activity**: focus on flow of control from one activity to another

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4

Development Process

- High-Level capture of requirements
  - Use Case Diagram
- Identify major objects and relationships
  - Class diagram (object diagram)
- Create scenarios of usage
  - Interaction Diagrams
    - Sequence Diagram
    - Collaboration Diagram
- Generalize scenarios to describe behavior
  - State Diagram
  - Activity Diagram
- Refine to add implementation details
  - Implementation Diagrams
    - Component Diagram
    - Deployment Diagram

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