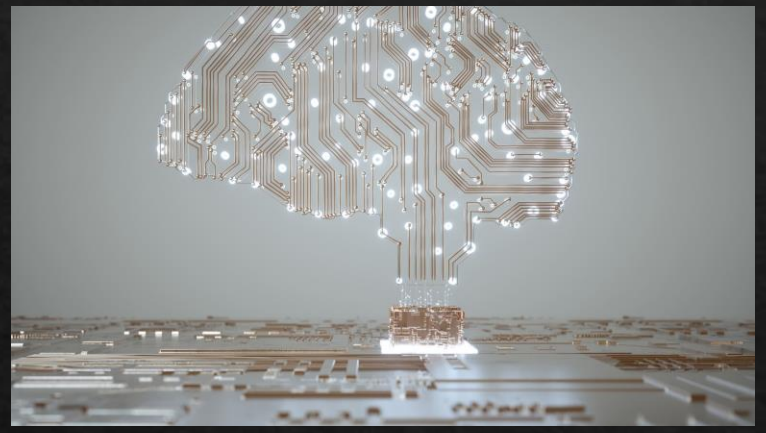

Artificial Intelligence Project 1

Lecture 1

Dr. Hari M Koduvely

General Information

Welcome to the Course!

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General Information

- Course Brightspace page
  https://brightspace.algonquincollege.com/d2l/le/content/678354/Home
- Please read the course outline and course section information (CSI)
- Main focus of this course is **project work** with clients from outside
- **Professional behavior** is expected from all the students
- Project work would be done in small groups of size ~ 5

General Information

- Course pass criteria
  - For courses that have both theory and practical components minimum 50% (D-) in both the components

General Information

- References
  - Agile In a Nutshell - http://www.agilenutshell.com/
  - All You Need to Know about Agile Software Development – Alex Campbell
  - Agile Testing – A Practical Guide for Testers and Agile Teams (O'Reilly Online Learning)
  - Agile Discussion Guide – LeanDog
    (Free download available here https://www.leandog.com/agile-discussion-guide-download)
  - Software Engineering for Data Scientists
  - Designing Machine Learning Systems

Artificial Intelligence Software Development

Artificial Intelligence Software Development

- AI System = Code + Data
- AI System development is an iterative process
- Will have all the processes involved in standard software development Plus more
- Standard Software Development: Agile Process + DevOps
- AI System Development: Agile Process + MLOPS

Artificial Intelligence Software Development

- Standard Software Testing: Testing the Code
- AI System Testing: Data and Code Testing + Monitoring Prod
- When Standard Software fails error codes are produced
- AI Systems can fail silently
- AI Systems can deteriorate performance over time if input data distribution changes

Software Development Cycle

- SDLC Is a process for planning, creating, testing and deploying a software
- Typically consists of 6 stages:
  - Requirement Analysis
  - Design
  - Development and Testing
  - Implementation (Deployment)
  - Documentation
  - Evaluation

Software Development Cycle

- Modern software systems are complex to build
- Objective of SDLC is to
  - Build high quality software
  - Based on customer requirements
  - Within scheduled timeframes
  - Underestimated cost budgets

Software Development Cycle

Different SDLC Methodologies

- Agile
- Waterfall
- Rapid Prototyping
- Spiral
- Incremental
- Extreme Programming

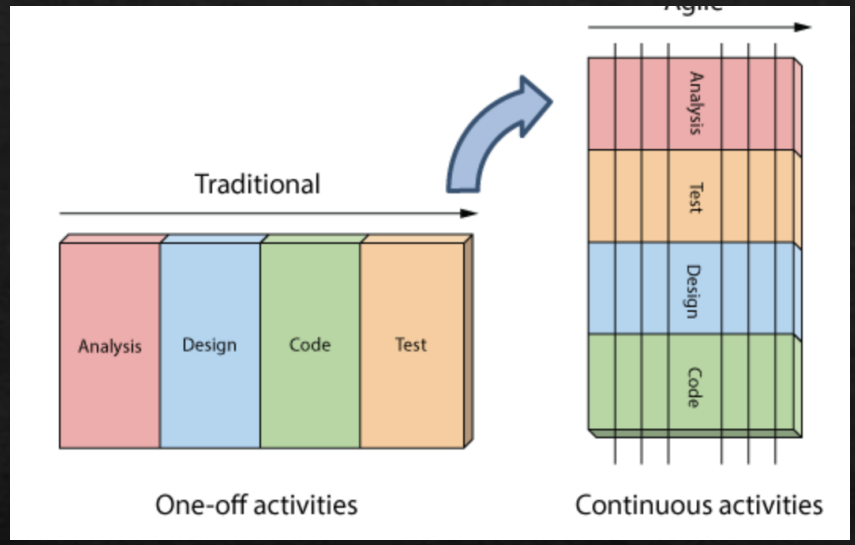
Software Development Cycle

Different SDLC Methodologies

- Waterfall
  - Projects are carried out in a linear sequential manner through the phases of conception, initiation, analysis, design, construction, testing, deployment and maintenance
- Spiral
  - Risk driven software development process model. Based on the risk pattern of a given project, the process guides the team to adopt different process models.
- Iterative & Incremental
  - develop a system through repeated cycles (iterative) and in smaller portions at a time (incremental)
- Extreme Programming
  - A type of agile software development. Advocates frequent releases in short development cycles, intended to improve productivity and introduce checkpoints at which new customer requirements can be adopted.
- Agile

Agile Software Development

- Agile is a set of principles and values that guides software development.
- Manifesto for Agile Software Development was created in 2001 by a set of top developers.
- There are different methodologies for approaching an Agile project.



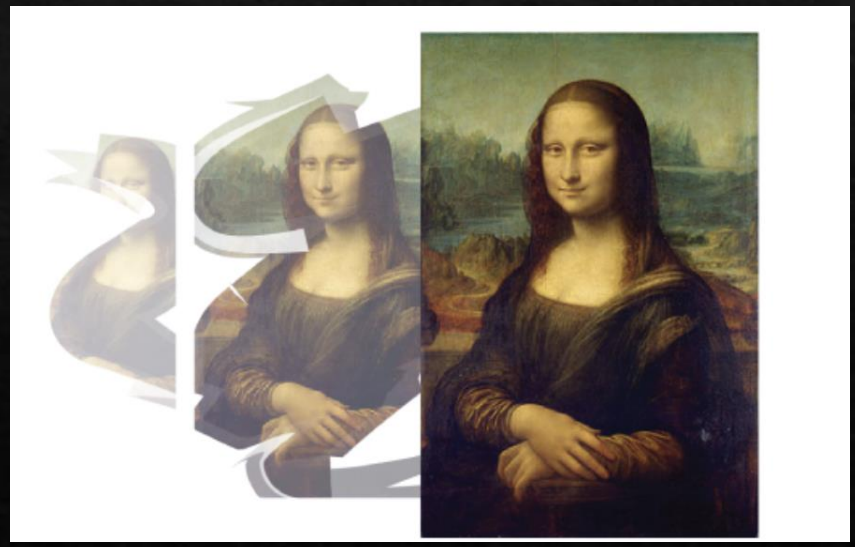


Image Source: Agile in a Nutshell

Agile Principles

1. Highest Priority is to Satisfy Customer through Early and Continuous Delivery of Valuable Software
2. Welcome Change in Requirements Even Late in Development
3. Deliver Working Software Frequently with Preference to a Shorter Time Scale
4. Business People and Developers Must Work Together Daily through the Project.
5. Build Project through Motivated Individuals, Give them the Environment and Support Needed.
6. Face-to-Face Conversation is the Most Efficient and Effective Method of Communication

Agile Principles

7. Working Software is the Primary Measure of Success
8. Agile Process Promote Sustainable Development
9. Continuous Attention to Technical Excellence and Good Design Enhances Agility
10. Simplicity - The Art of Maximizing the Amount of Work Not Done is Essential.
11. The Best Architectures, Requirements and Design Emerges from Self Organizing Teams
12. At Regular Intervals, the Team Reflects on How to Become More Effective

Agile in Practice

- Make a list of User Stories
- Size the stories relative to each other and estimate the effort
- Break down the user stories to tasks
- Prioritize the user stories and tasks
- Start executing the tasks
- Update the plans as project progresses

Tools for Agile Development

- Software version control - Git
- Project management – Microsoft Teams Planner
- Communication - Microsoft Teams