M.Sc. Data Science (DAT)

SCHOOL OF SCIENCE AND TECHNOLOGY
PAN-ATLANTIC UNIVERSITY

DAT 620 – Blockchain, Web and Mobile Technologies
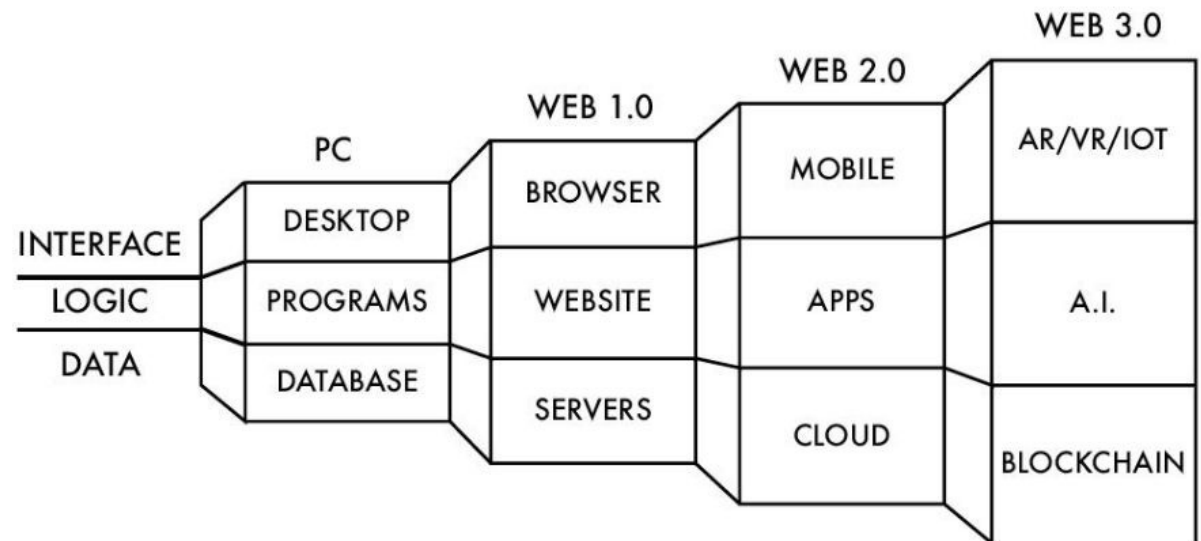
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Emerging Technologies

⛨ Where is the revolution heading?

– Web 1 ➔ Web 2 ➔ Web 3?

Source: Web 3.0 will be an Autonomous Spatial Web. (2021, September 9). InWeb3. https://www.inweb3.com/web-3-0-will-be-an-autonomous-spatial-web/

Course Objectives

- The goal of this course is on the one hand to help students understand the evolution of platforms layered on the Internet, for delivering solutions to end-users.

- In addition, the course will introduce students to the writing of mature programs for different platforms (Desktop, Web, Mobile, Blockchain), leveraging on industry standard DevOps (development operations).

Learning Outcomes

- At the end of this course, the students should
  - be able to write functional applications in the following categories
    - Web applications (classical)
    - Mobile applications
    - dApps (decentralized applications)
  - also be introduced to JavaScript, TypeScript and related libraries like React.
  - be able to use Web application frameworks in Python and JavaScript.
  - be able to deploy models on the Web using python libraries designed for the purpose, e.g. Streamlit.
  - be able to incorporate React components into Streamlit for more efficient transitions.
  - Deploy models on mobile

...Learning Outcomes

...At the end of this course, the students should

- get to know modern DevOps e.g.
  - Version Control
  - Continuous Integration / Continuous Delivery (CI/CD)
  - Containerized Deployment

Outline

- Topic 1: Introduction
  - An overview of where this course fits in the life of a Data Scientist.
  - Getting started with basic development tools for the course
    - VS Code IDE
    - Git
    - Docker
    - ...

Outline

– Topic 2: An overview of platform evolution

- Internet
- Web
- Mobile
- Blockchain / Web3

...Outline

- Topic 2: Overview of Platforms (cont'd)
  - Blockchain
    - Web3 Technology Stack
    - Emerging Concepts. E.g.
      - Cryptocurrencies
      - Tokens
        - » Non-fungible Tokens (NFT)
        - » Fungible Tokens
      - Decentralized finance (DeFi)
      - Decentralized Autonomous Organisations (DAO)
      - Crypto Market making / Automated Market Making (AMM)

...Outline

- Topic 2: Overview of Platforms (cont'd)
  - Metaverse
    - XR (AR/VR/MR) Concept
    - Technology Stacks
      - Oculus Quest
      - HoloLens
      - WebXR
    - NFTs and the Metaverse

...Outline

- Topic 3: Solutions for the Web
  - Solution Architectures
    - Backend Engineering
    - Frontend Engineering

- Topic 4: Web Application Primer in Python using Flask WAF

- Topic 5: Web Application Primer for Data Science using Streamlit library

...Outline

- Topic 6: JavaScript/TypeScript/React Primer

- Topic 7: Mobile Solutions (Android & iOS)
  - Native codes with React-Native

...Outline

- Topic 8: Solutions for the Blockchain
  - Backend (Smart Contracts) with Viper
  - Frontend (Web3) with Web3.js and React/React-Native.

...Outline

- Topic 9: More on DevOps
  - Continuous Integration / Continuous Delivery
    - GitHub Actions
  - Distributed Container Deployment
    - Kubernetes