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The Role of AI and ML in Software Testing

Use case of AI in Testing

- case generation
- test execution
- result analysis

Popular Tools

- Eggplant AI: create test cases, automate test execution, and analyze results
- test.ai: generate and prioritize test cases based on their likelihood of finding defects.
- Selenium: used for Web
- Appvance: used for UX
- AppliTools Eyes: used for visual testing
- Katalon Studio: suggest test cases based on previous test results
- Tricentis Tosca: employs ML to optimize test case design and execution

NLP can be used to understand and generate test cases from software requirements written in English

- reducing barrier of entry
- useful in Agile

Strategies

- Classification
 - o Predicting the outcome of new test cases based on input and label
- Clustering
 - o Discovers new patterns in semantic errors,
 - o Might be able to extend the coverage of error cases.
- Reinforcement
 - o Agents interact with software environment, learning from feedback to continuously improve test case generation and execution strategies.

Challenges

- CI/CD of the testing tool
- Compatibility with the existing company system
- Algorithmic complexity
- Large datasets for training

Ethical Concerns

- May have a lot of bias due to how a company's software engineers write code
- Potentially displace human testers -> even less jobs