Autism Searches

A modern search engine for ASD related topics
The Team

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Full Stack developer

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Back-end developer and Machine Learning implementation

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Logo creation and database engineering, UI design
Application Overview

- Recommendation system for ASD-related articles
- Single page application (SPA)
- Hope to enrich the public’s knowledge about Autism
- Hope to enhance research ability within the field
The Layered Architecture Approach

- 4 main layers to the application
  - Controller
  - Business
  - Data Access
  - Common

- Layers are loosely coupled
  - Allows for easy updating
  - Allows to swap layers or create new layers with ease

- Scalability, to an extent

- Readability
Technical Stack

Python

Java with Spring MVC

Javascript, ReactJS

JSX, CSS

Back End

Front End
Built in Java using the Spring MVC
Each service within the business layer extends an interface
  - Scalable
  - New layers easily buildable
Aspect-oriented programming (AOP) to connect all layers
Jackson framework for serialization and deserialization of JSON files
OOP design best practices
  - Favoring composition over inheritance whenever possible
Design Patterns
  - Factory pattern
  - Visitor pattern
  - Adapter pattern
Machine Learning

- Machine learning is accomplished using a periodically updating python script
  - Data is pulled from APIs, then accessed by Python
  - TFIDF vectorization with Cosine scoring generates recommendations for each article
  - Results of recommendations are returned to the back end to display to user
Testing with Mockito

- Test driven development was a core design principle
- Each layer uses stubbing and object mocking to allow for unit testing across layers
-Mocks are injected into each layer to allow testing without disrupting the data
Application Demo
Concluding Remarks/Future Work

- Java gave the team the ability to fully realize the layered architecture approach
- However, on review, the JVM is not utilized to its full potential
- Other languages excel at I/O bound tasks, which could have provided us another option