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AI Powered Standardized Testing

A common sentiment among many students in the current generation is that standardized testing does not adequately provide a fair experience. Standardized tests are too rigid in structure and do not actually measure whether students actually understand the material they are being tested on. Artificial Intelligence combined with natural language processing helps mediate this issue, providing solutions to students allowing them to be able to express their understanding in a natural way, and to instructors, removing the burden of grading.

The problem with standardized testing right now is that they fail to properly measure students' aptitude and intelligence. This is due to the very nature of the tests. Most standardized tests are comprised mostly of multiple choice or numeric questions. The problem with these types of questions is that there is only one correct answer. When there is only one correct answer, the approach that student took is not taken into account when grading the test. This is due to the sheer amount of time it would take humans to individually grade each students' response based on approach rather than final answer. However, by using Artificial Intelligence and natural language processing, this problem can be overcome.

An online testing service powered by artificial intelligence and natural language processing allows for more accurate scale-based grading of intelligence and understanding of subject material. This allows for more open ended questions without heavily modifying current

testing paradigms. From the time a student begins a question, all activity and interactions will be monitored, stored, and used to build a model of a correct approach to the problem. Students would also be allowed to explicitly provide an explanation of their work, which will then be assessed using natural language processing to determine if the student actually understands what they are doing instead of regurgitating a memorized answer. This is also be useful in cases where a student does not arrive at the correct answer, but is able to provide a proper explanation of what the correct approach would be. Using both AI and traditional testing methods in tandem allows for a more accurate measure of students understanding of material while also removing the burden of grading placed on instructors. All of the data collected by the testing service is also useful for instructors to see the difference in how they are delivering information and how students are perceiving it. The testing service produces a model of what the average student was able to understand and reproduce. Using this information, instructors are able to adjust their teaching style or go over any topics that were shown to be less understood.

Many online testing services currently exist and are used in teaching institutions worldwide. However, these services are merely an online facsimile of the outdated paper tests. They only allow for the same types of questions used in paper tests. Anything with short/long answers are deferred to humans for processing/grading. These services do not allow for integrated real time natural language processing that an artificial intelligence testing service provides. By housing all of these features in one place, instructors and students alike benefit from a central place to gather and analyze data.

This service will be developed using data and data collection methods as the main schema. Data plays an important role in this service. Models need to be built around how

questions and answers should be formed. Because of this, most of the development is around data gathering and model building. This is the core feature that separates this system from other existing systems. For ease of use and integration, the data will be captured as natural language, later to be processed into something that can be used to build models. Other core features such as the client-facing front end will borrow from popular in place systems. However, due to the nature of artificial intelligence and natural language processing, the back end of the system is designed to handle larger data sets while maintaining real time access. Processing all the data requires more computing power than a standard system. Because of this, the system is best run on a computer cluster with sufficient storage to house all data collected. All of these components together provides customers a more advanced and intelligent experience of the online testing systems they may have used in the past.

Deployment of this service is similar to how current Learning Management Systems (LMS), such as Canvas are deployed. Institutions that wish to incorporate this artificial intelligence testing system will do so by purchasing a subscription to the service. Since everything is available online, all an institution needs to do after purchasing their subscription, is to create a school specific account. Doing so will allow them to customize configurations depending on their specific scenarios. On the same system, administrators are able to allocate different types of users, "Instructors", "Students", "Graders", "Parents". This system aims to add modern Artificial Intelligence to existing Learning Management Systems without changing the overall look and feel of the systems. This allows for easy adoption as users will already be familiar with such a system.

Works Cited

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