eLearning Platform in Accessibility

Computer Science Capstone Proposal

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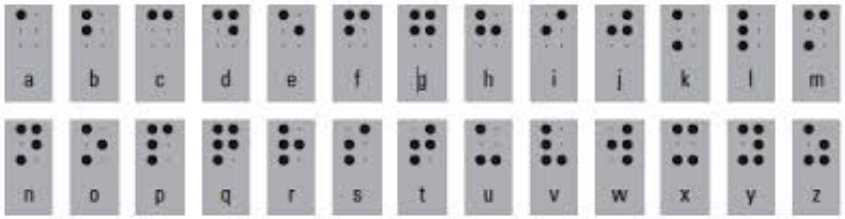
Project Motivation and Background

- Unified English Braille (UEB) is a new braille code
- An estimated **286,000 working-age braille users**, and the thousands of professionals who provide service and training to people who are blind and visually impaired, will need to learn UEB.
- No instructional tool harnesses the power and ubiquity of new **mobile devices**, interactive **eLearning**, **educational gaming**, and **social networking** for learning braille, nor has anyone developed a platform suitable for a wide range of adult learners.



Project Goals

- The goal of this project is to build an educational eLearning platform that includes:
  - eLearning experiences designed to be **interactive**,
  - multimedia and educational **gaming** designed to be engaging, and
  - **social networking** and telecommunication meant to be connective and motivating.
- This platform will serve multiple projects, including to
  - teach people **Unified English Braille** (UEB) by integrating **gaming** and **social networking** components and
  - help people serving individuals with disabilities impacting speech through **practice** and **simulation**.

Requirements (1)

- Web-based platform
- Support 10,000 active users by year 5.
- User management, group management
- Social networking integration (FB, Google+, Twitter) for increased motivation.
  - Send challenges to other users.
  - Collaborative learning
  - Share success stories (e.g., certificates)
- Adaptive learning and feedback for increased motivation
- Instructional gaming component
- Accessibility
- User-friendly
- Users can obtain certificates

Requirements (2)

- Support for Braille devices
- UEB translation
- Scalable (50,000-100,000 users) and highly reliable platform.
  - Distributed
  - Multi-processor and multi-core capable
- Database
- Integration with other learning platforms.
- Integration with future iOS and Android apps.

Capstone Outline and Steps (1)

1. Platform evaluation study
    1. Our suggestion is to use the Java Enterprise framework for the back-end.
2. The primary goal is to build a solid and flexible back-end that can be expanded throughout the project.
3. One part of the team will work on the front-end, the other on the back-end.

Capstone Outline and Steps (2)

Back-end requirements:

1. User and group management
   - Credentials
   - Profiles
   - Game scores
   - Lesson content management
   - Keeping track of learning scores, grades, etc.
   - Adaptive learning servlet
   - Educational certificates management
   - Social networking data (friends, etc.)
2. Implement braille back translation (or use existing libraries/modules)
3. Store educational content (lessons, textbooks, audio-visual, etc.)
4. Provide APIs to other platforms and devices

Capstone Outline and Steps (3)

Front-end requirements:

1. Visually pleasing web-interface
2. Fully accessible
3. Support for a wide range of media formats
4. Social networking integration

Software Distribution

- All code will be open source
- Development on GitHub
- Deployment on dedicated server

Why Pick this Project?

- A unique opportunity to build an open source learning platform that will be used in the real world.
- Showcase the project on your resume.
- Potential to interact with interested partnering companies, such as Google, Humanware, Duxbury, etc.
- Collaborate with a very interdisciplinary team at PSU.
- Easy access to users with disabilities for beta testing
- Make a difference for individuals with disabilities.