LingoPros

AuToBI Toolchain and Web Hosted Analyzer

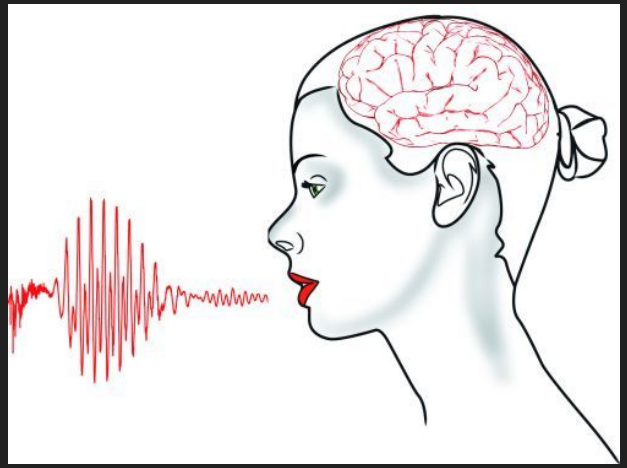
Josh Shaffer, Matthew Quintana, Erik Strauss & Luis Montes
Mentor: Ana Paula Chaves Steinmacher

Speech Analysis

What is speech analysis?

- Measuring prosodic features
- Language Proficiency

Prevalence of Automatic Speech Recognition

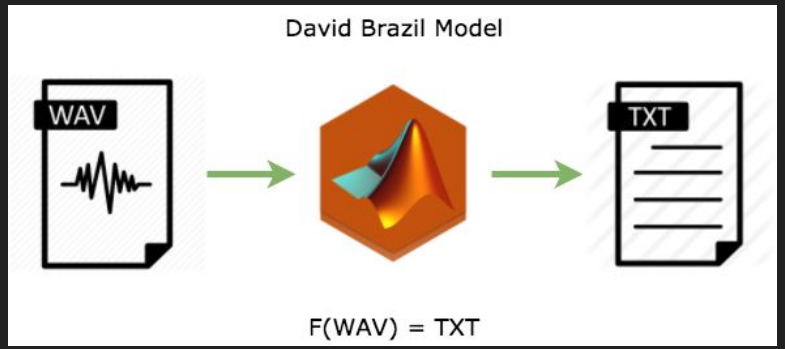


https://www.fel.cvut.cz/en/vv/tymy/sami/11.jpg

Dr. Okim Kang and Dr. David O. Johnson

Applied Linguistics Speech Lab

- Native vs Non-native English speakers
- Difficulty annotating audio samples
- Developed their own speech analyzer: The David Brazil Model



The Brazil program

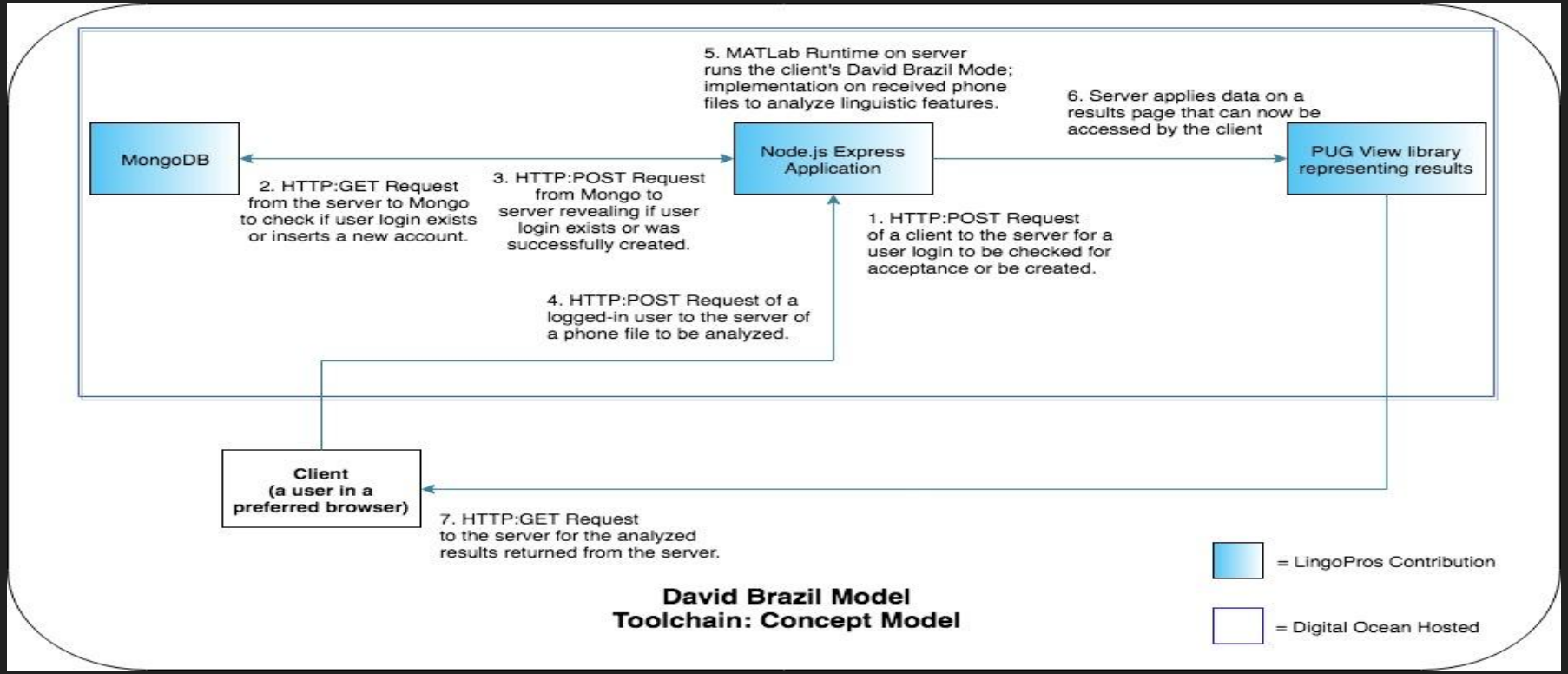
- Slow and inconvenient to use.
- Client wants the program to be accessible online

AuToBI Problem

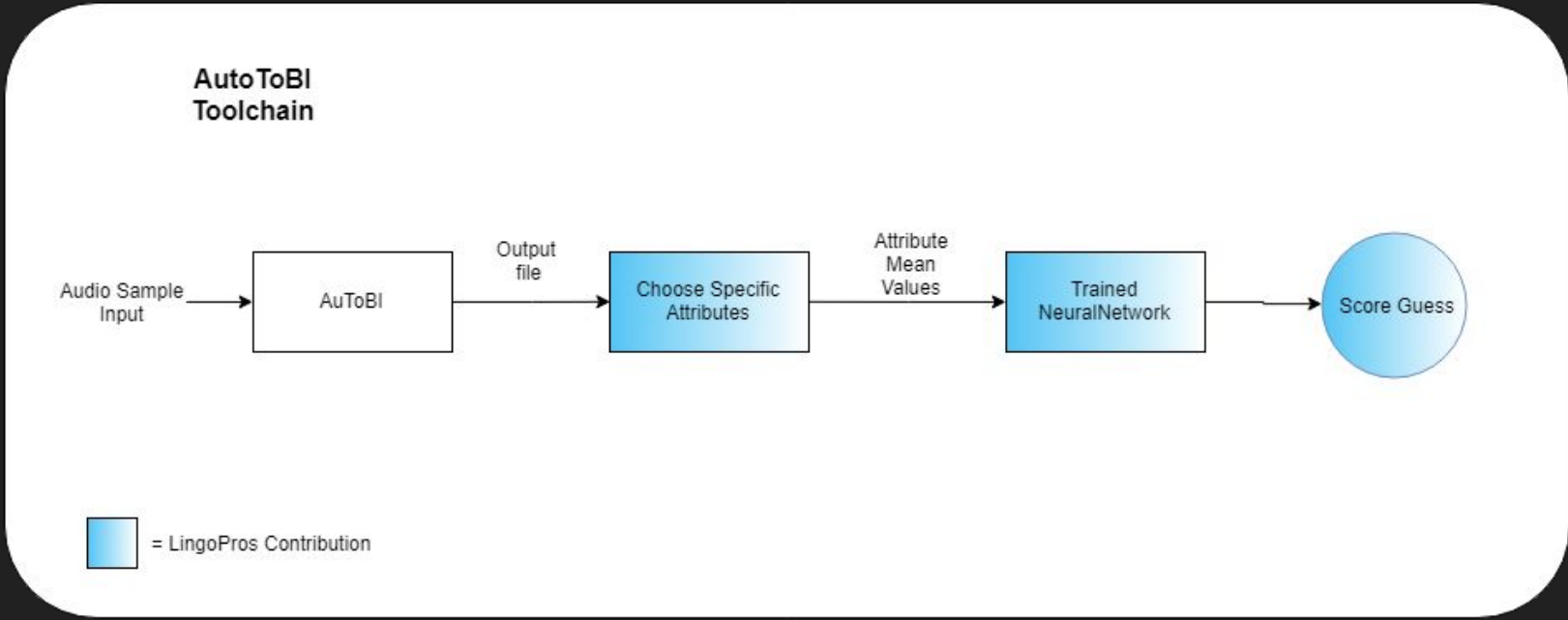
Standard framework using Tones and Break Indices (ToBI) model

- Brazil vs ToBI Model
  - Experimental vs Standard
- Issues:
  - Brazil criticized for not being the standard in speech analysis
  - No current proficiency analyzer to compare with

David Brazil Model Solution



AuToBI Solution



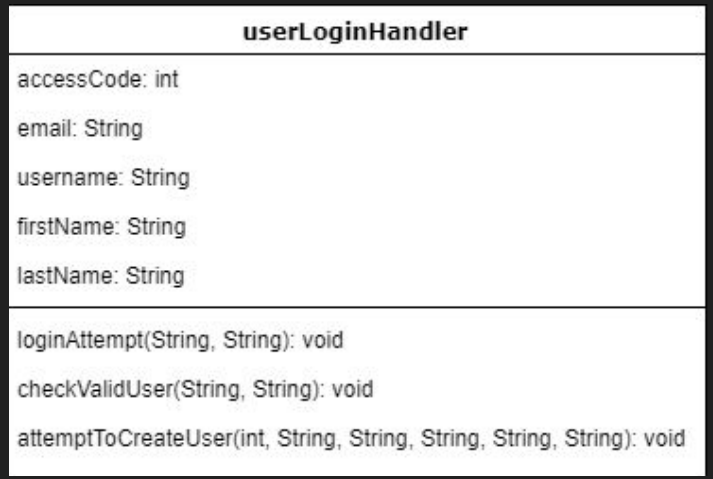
David Brazil Requirements

- Upload phone file
- Web Server
  - User Login
  - Admin page for verifying users
  - Results are displayed from the server-side application.
- Program hosted on server for designated users
  - Locally at a minimum

AuToBI Requirements

- Run AuToBI analysis with multiple files
- Feature selection
- Machine Learning on features
- Calculate proficiency score

David Brazil Website Implementation



AuToBI Toolchain Implementation

Challenges and Resolutions

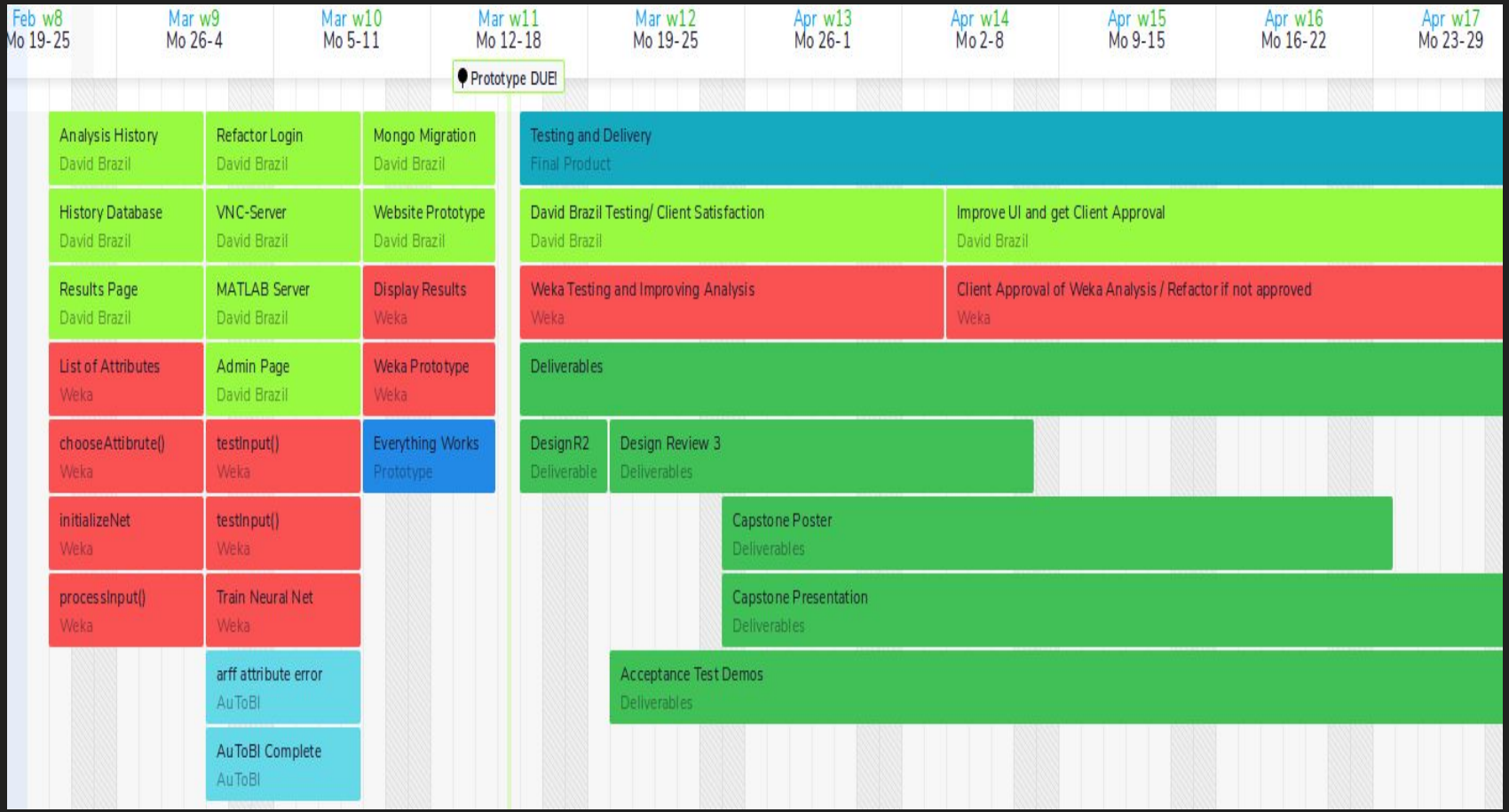
To Us:

- Failure to complete full David Brazil Analysis locally.
- Failure to create MATLab runtime environment on the DigitalOcean Box
- Feature selection
- AuToBI file generation - attribute error and data mismatch

To Client:

- Digital Ocean hosting fee.

SEMESTER SCHEDULE:



Conclusion

- Website
  - David Brazil Model- Dr. Okim’s Program.
    - Slow, inconvenient, inaccessible
  - Audio files are analyzed online
- AuToBI Machine Learning Program
  - Use AuToBI output to pass to a Java API for feature selection
  - Pass to a neural network to calculate proficiency score

Thank You

Joshua Shaffer - jls865@nau.edu,
Luis Montes, Matt Quintana, and
Erik Strauss