LingoPros

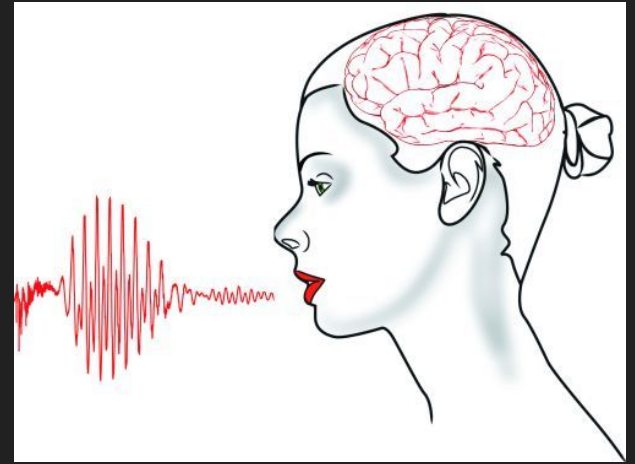Josh Shaffer, Matthew Quintana, Erik Strauss &
Luis Montes

Hello.

Speech Analysis
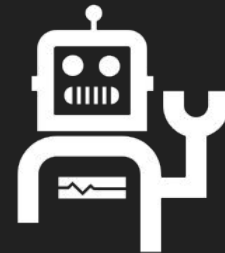
What is speech analysis?

- Measuring prosodic features
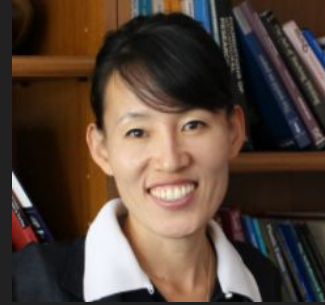- Language Proficiency

Prevalence of Automatic Speech Recognition
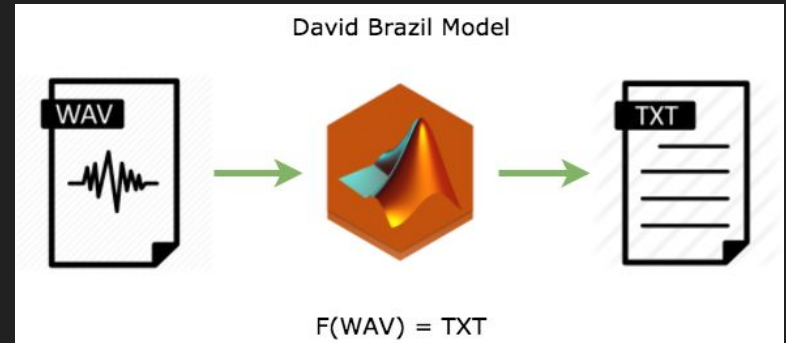
https://www.fel.cvut.cz/en/vv/tymy/sami/11.jpg

Dr. Okim Kang and Dr. David O. Johnson

Applied Linguistics Speech Lab

- Native vs Non-native English speakers
- Difficulty annotating audio samples
- Develop their own speech analyzer

The Brazil program

- Brazil vs ToBI Model
  - Conversational vs Recited speech
  - Experimental vs Standard
- Issues:
  - Criticized for not being the standard in speech analysis
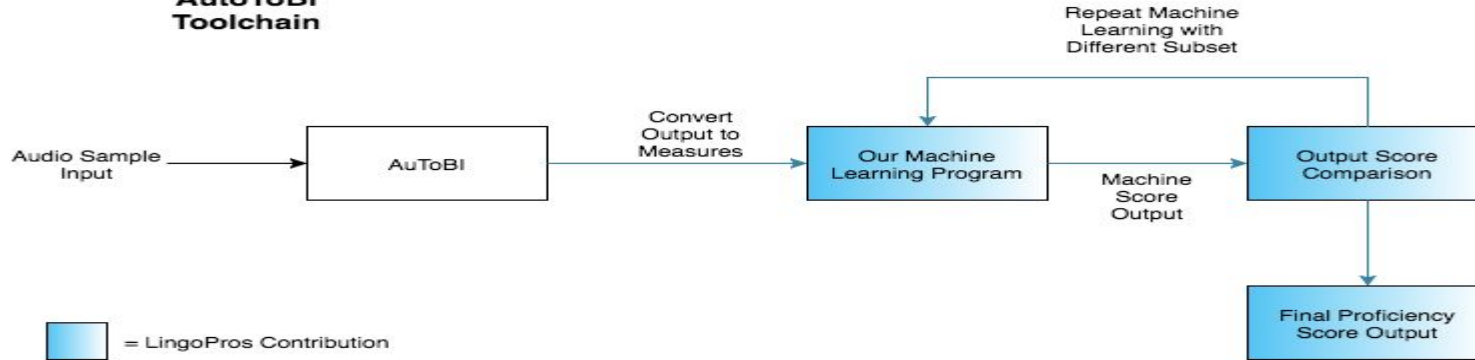 - Slow to use, inaccessible, inconvenient

Prosodic Labeler

- Comparisons
- Need to be able to analyze speech in a timely manner
- Current software works, but has shortcomings

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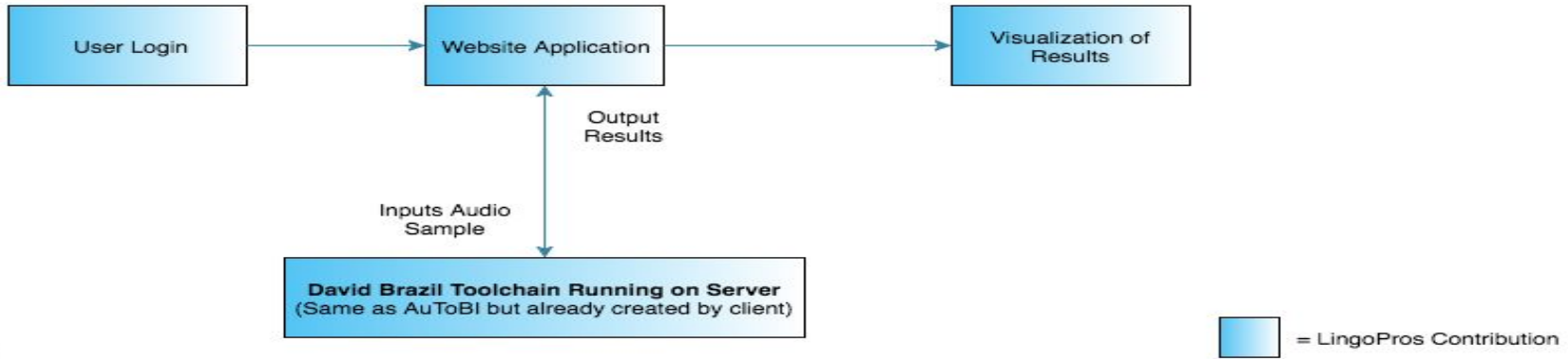
- Build a new prosodic labeler
  - AuToBI
  - Machine Learning
- Create a web portal

- AuToBI Framework
  - Outputs ARFF file
  - File contains prosodic measurements
  - File is input to machine learning software
- BigML & Weka
  - Machine learning Java API used to score AuToBI prosodic measurements.
  - VIsualizes results on website using cloud storage for client to see.

David Brazil Model Website

- User Login → Website Application → Visualization of Results
- Output Results
- Inputs Audio Sample
- David Brazil Toolchain Running on Server (Same as AuToBI but already created by client)
- = LingoPros Contribution

- ● Web Server (Tomcat)
  - ○ Runs David Brazil Model labeler through server
  - ○ Allows users to upload sound files to input into the prosodic analyzer.
  - ○ Store user history and previous analysis.

Functional Requirements

- Upload audio files (.wav, .mp4, etc.)
- AuToBI Program Analysis
- Convert Output
- Machine Learning software
  - Compare score to human.
  - Display results for client to compare.
- Web Server
  - User Login
  - Display historical results
  - User inputs audio file to be analyzed.
  - Results are displayed from the server-side application.

Non-functional

- Faster than manual
- 75% accuracy of AuToBI Machine Learning Program
- Code security (copyright)
- User security
- Readable code

Risks

To Us:

- Future Legal Issues: Copyrights involved and Github's openness.
- Failure to convert David Brazil Model MATLab to runnable Java Classes
- Failure to convert AuToBI output to suprasegmental features.

To Client:

- Storage Expenses: NAU ITS has its limits.

To Users:

- Server Crashes: Cannot guarantee 24/7 running of David Brazil

SCHEDULE

LingoPros

TO DO	NOW-DEC.	JAN.	FEB.	MARCH...
AuToBi Output Conversion	▬			
Machine Learning Demo	▬			
Tomcat Server Demo	▬			
Website Demo	▬			
David Brazil Running On Tomcat		▬▬		
AuToBI Machine Learning		▬▬		
Functional Prototype		▬▬▬		
Final Product				▬

Conclusion

- Comparing Two Different Prosodic Labelers
  - David Brazil Model- Dr. Okim's Program.
    - Currently a slow inconvenient process and inaccessible to users.
  - AuToBI Model- Industry standard labeler.
    - No current program to determine proficiency or visualize results.
- Website
  - Audio files are uploaded to server Running Dr. Okim's program .
  - Website displays the results and archives it with previous results.
- AuToBI Machine Learning Program
  - Audio files input into AuToBI program for analysis.
  - The output is converted into measures which are scored by the program.
  - The results are displayed so that the client can easily compare.

Thank You

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