

- **Project Overview**
 - **Motivation:** Analyze the physical and perceptual differences between phonemes that have different forms of phonological contrast
 - Looking at the [k] and [c] sounds in English, Turkish, and Vietnamese
 - **English:** allophones - non-contrastive, usually non-distinctive
 - **Turkish:** quasi-phonemes - non-contrastive, distinctive
 - **Vietnamese:** separate phonemes - contrastive, distinctive
- **Palatograms/Spectrum Analysis**
 - **English**
 - [ci], [kap], [tʃɪp]
 - key, cop, cheap
 - key, cop, cheap
 - **Turkish**
 - [ici], [kapi], [tʃim]
 - iki, kapı, çim
 - two, gate/door, grass
 - **Vietnamese**
 - [cia], [ca], [kao], [tʃɪp]
 - chia, cha, cao, English[cheap]
 - divide, dad, high, cheap
 - Note: can't even find high/front vowels with [k]
- **Phoneme Confusion Test**
 - **All Languages**
 - Consonants: [c, k, tʃ, ʃ, t]
 - Vowels: [a, o, u, i, ɔ, ʌ, ɛ, æ, ø, y, e, ɪ]
 - Test with all 60 pairs
 - **English** as in...
 - key, car, chat, ship, tap
 - Prep English speaker for key vs car beforehand
 - **Turkish** as in...
 - kir, kol, çok, şeker, tuz
 - dirt, arm, a lot, sugar, salt
 - **Vietnamese** as in...
 - cha, cơm, **chat**, **ship**, tên
 - dad, rice, **chat**, **ship**, name
 - Red words in English because Vietnamese doesn't have those sounds
- **Learnability**
 - **Rule:** all words receive suffix -[ci] or -[ka] depending on vowel harmony (to simplify all root words will end in [i] or [a])
 - Training samples will all have correct pronunciation

- Test samples will include examples with correct/incorrect vowel harmony paired with correct/incorrect palatalization
- Potential Sources of Error
 - I may not pronounce words perfectly