A Brief Story of *Tone Perfect*: a Mandarin Chinese Audio Database

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the Tone Perfect Team

Overview

I. What is *Tone Perfect?*
II. How it came about
III. How to use *Tone Perfect*
IV. Broader Implications and Future Developments

Part I: What is *Tone Perfect*?

Tone Perfect:

Multimodal Database for Mandarin Chinese

https://tone.lib.msu.edu/

*An exhaustive collection of **monosyllabic sounds** in Mandarin Chinese, including “lexical gaps” (410 in total)

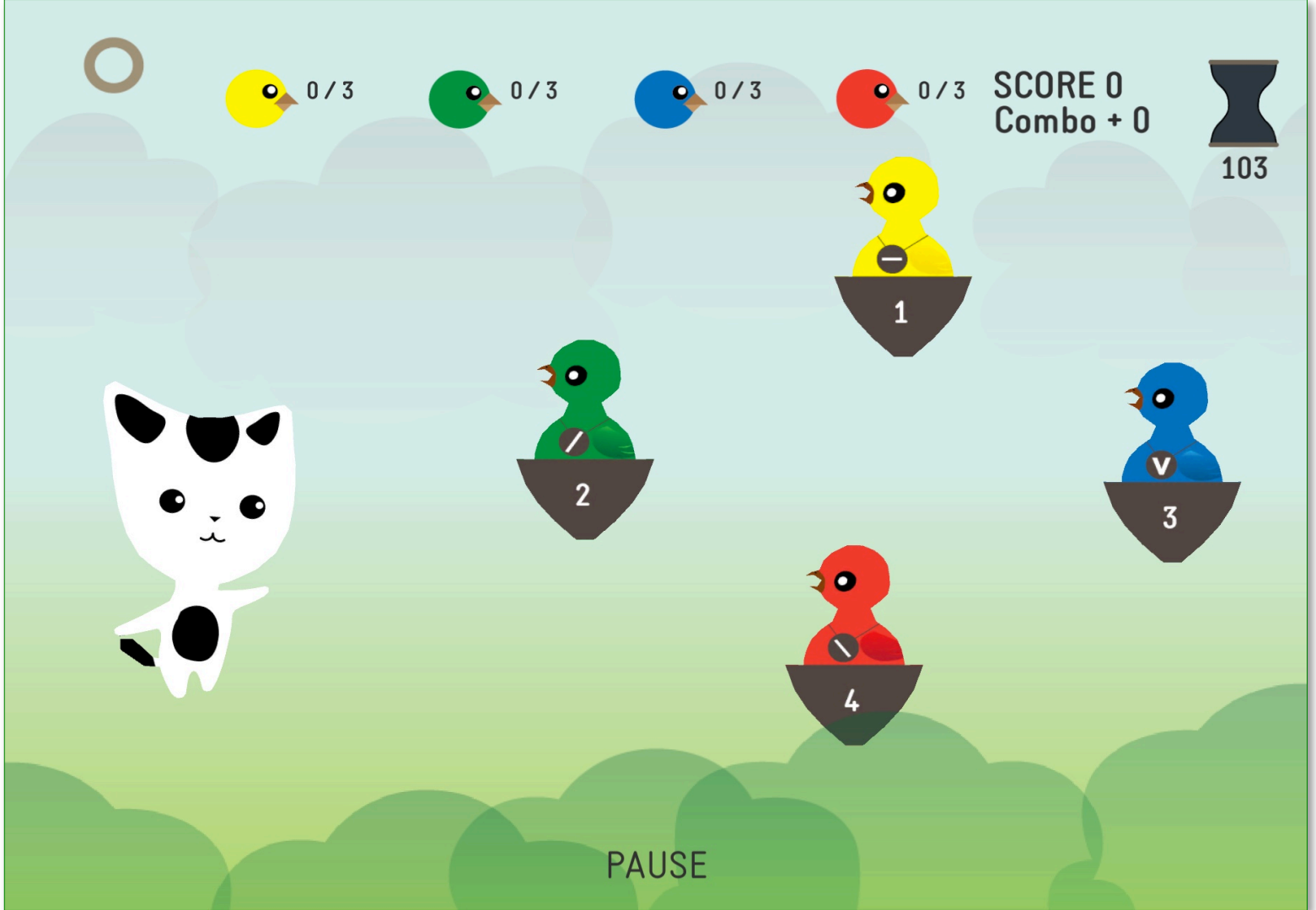
*In all 4 tones (410 x 4 = 1,640)

*6 native Mandarin speakers (3 female and 3 male)

*9,840 audio files (6 sets of 1,640) in CD quality

Part II: How *Tone Perfect* Came About

PICKY BIRDS
START
TUTORIAL
CREDITS
EXIT


0 / 3
0 / 3
0 / 3
0 / 3
SCORE 0
Combo + 0
103
1
2
3
4
PAUSE

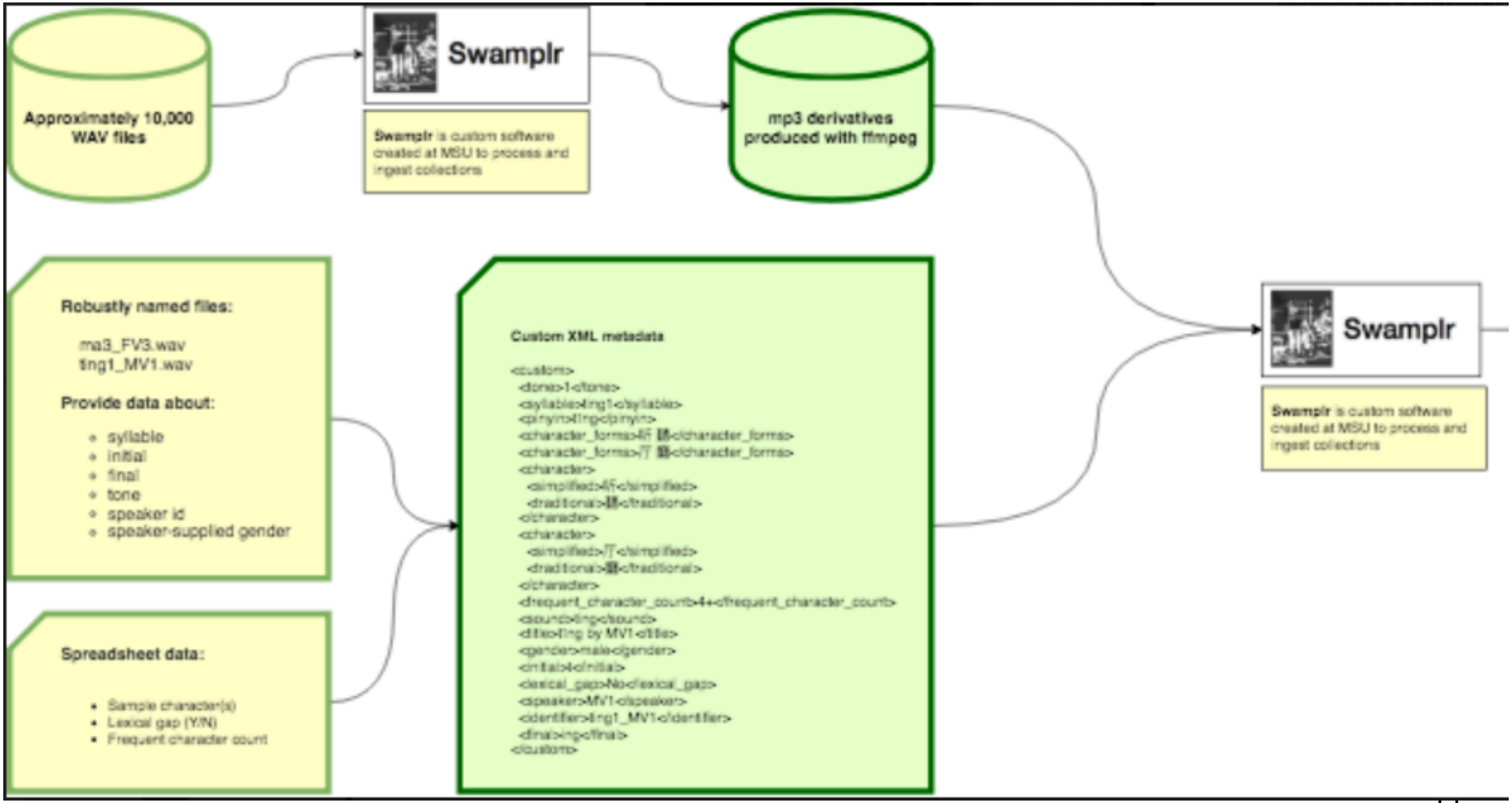
VOICE ACTORS
ZIJIN LIU
YIWEI LU
TIANYUAN WU
CHANGCHANG YANG
GONG YI
YIFAN ZHANG

Multimodal Database for Mandarin Chinese

A digital repository

as an accessible,

interactive web-based database


Approximately 10,000 WAV files
Swamplr
Swamplr is custom software created at MSU to process and ingest collections
mp3 derivatives produced with ffmpeg
Robustly named files:
ma3_FV3.wav
ting1_MV1.wav
Provide data about:
syllable
initial
final
tone
speaker id
speaker-supplied gender
Spreadsheet data:
Sample character(s)
Lexical gap (Y/N)
Frequent character count
Custom XML metadata
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<syllable>ting1</syllable>
<pinyin>ting</pinyin>
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<character_forms>厅 廳</character_forms>
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<traditional>聽</traditional>
</character>
<character>
<simplified>厅</simplified>
<traditional>廳</traditional>
</character>
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<sound>ing</sound>
<title>Ting by MV1</title>
<gender>male</gender>
<initial></initial>
<lexical_gap>No</lexical_gap>
<speaker>MV1</speaker>
<identifier>ting1_MV1</identifier>
<final>ing</final>
</custom>
Swamplr
Swamplr is custom software created at MSU to process and ingest collections

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Fedora™
Islandora
Set of Drupal modules for sharing Fedora Commons collections
Solr
Indexing software, enables search
Fedora Commons (3.8)
Repository platform
Backup storage
Multiple copies including off-site

Multimodal Database for Mandarin Chinese

*An outcome of a multidisciplinary collaborative project

The team!

Audio Production	Research	Digital Humanities	MSU Librarians	Supporting Units

Part III: How to Use Tone Perfect

Two Key Aspects of *Tone Perfect* As An Accessible Pedagogical Tool

Multimodality

Interactivity

Multimodality

Visualization of Tonal Information:
“Seeing & Hearing”

Tone-Number

Tone-Pitch Contour

Tone-Colored Wave Form

Multimodality

Scripts:
Sounds &
Comprehension

Pinyin (Romanization of Mandarin Sounds)

Traditional Chinese characters

Simplified Chinese characters

Identical sound/tone for multiple words

mā by FV1

ma1 / mā / 媽 / 妈 / "mother"

"High level tone"

má by FV2

ma2 / má / 麻 / "hemp"

"Rising tone"

mǎ by MV3

ma3 / mǎ / 馬 / 马 / "horse"

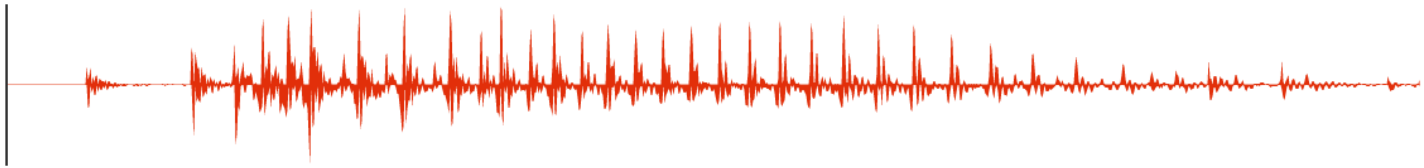
"Dipping tone"

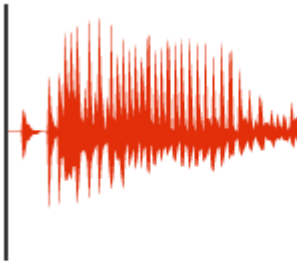
mà by MV2

ma4 / mà / 罵 / 骂 / "scold"

"Falling tone"

ài by MV3





▶ Play

ài by MV3

Simplified Character	爱 艾 唉
Traditional Character	愛 艾 唉
Pinyin	ài
Syllable	ai4
Tone	4
Lexical Gap	No
Speaker ID	MV3

Interactivity

Multiple search options to interact with the database

Sound

Tone

Speaker

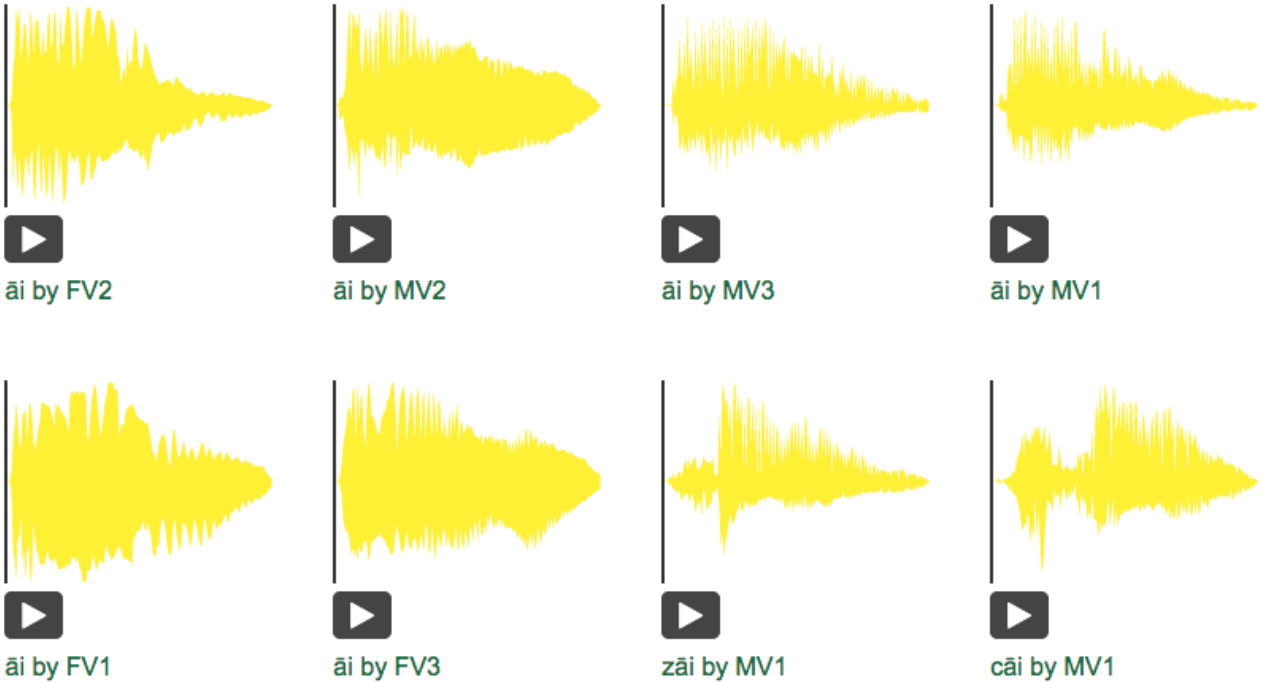
Gender

Lexical gap

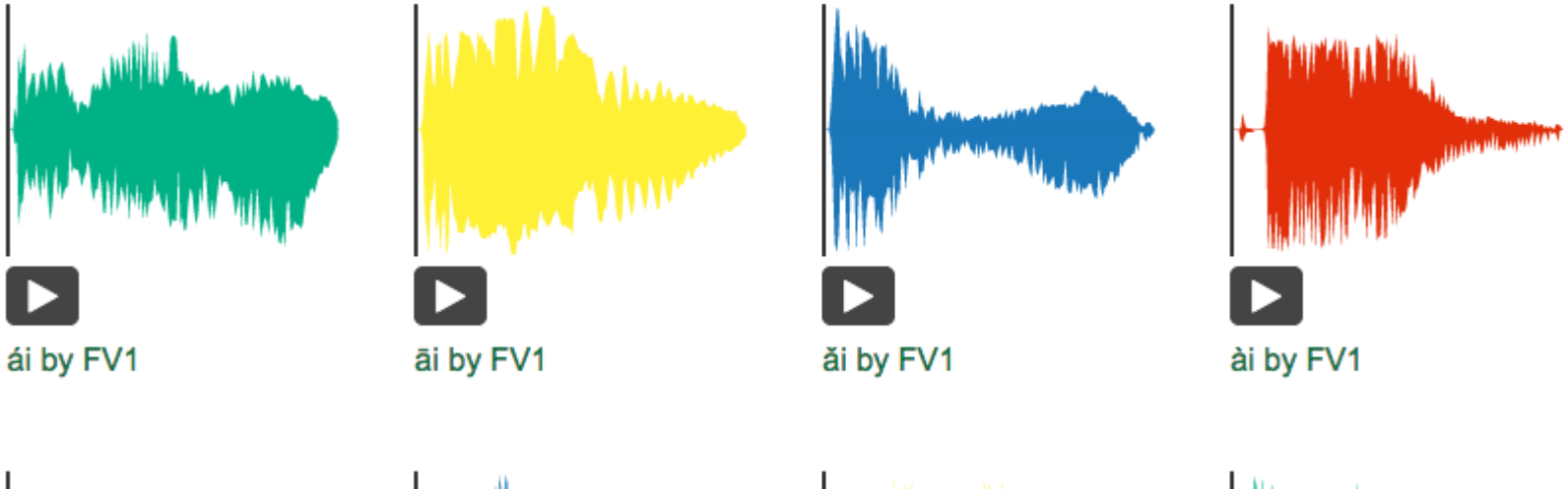
ai

Sound	Tone	Speaker	Gender of Speaker	Lexical Gap
ai (24)	1 (102)	FV1 (68)	female (204)	No (324)
bai (24)	2 (102)	FV2 (68)	male (204)	Yes (84)
cai (24)	3 (102)	FV3 (68)		
chai (24)	4 (102)	MV1 (68)		
dai (24)		MV2 (68)		
gai (24)		MV3 (68)		
hai (24)				
kai (24)				
lai (24)				
mai (24)				
Show more				

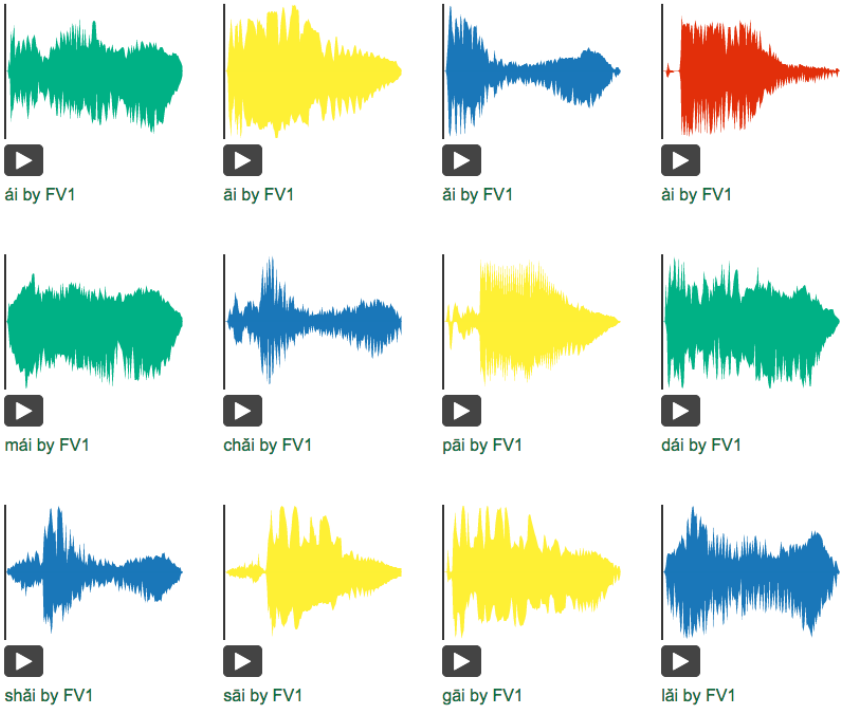
ai 1 by all six speakers



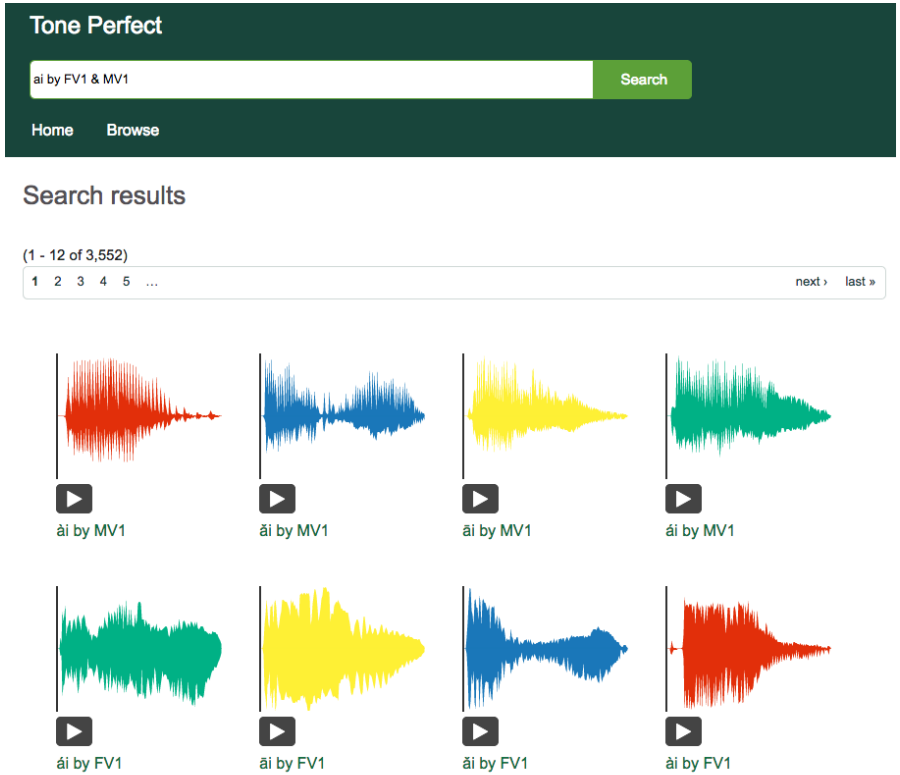
ai in 4 tones by FV1 only



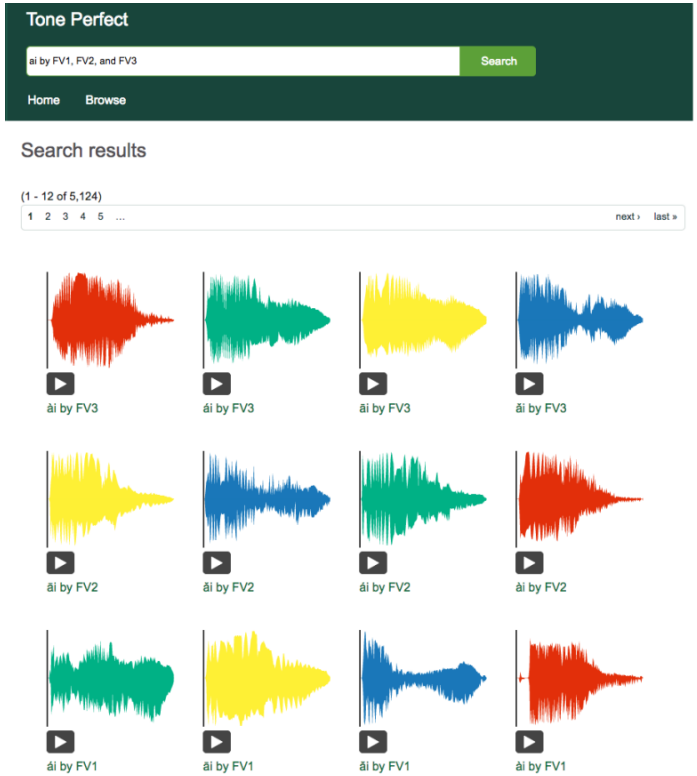
“ai” combined with other consonants produced by FV1



“ai” FV1 and MV1 Comparison



“ai” FV1, FV2, and FV3 Comparison



Multi-Repurposing Digital Resources with Multiple Download Options

M-ToPP (empirical L2 experiments)

Picky Birds (app)

Heart Doubt & Lingua Incognita (electronic music)

Psychoacoustic Analysis of Mandarin tones, etc.

Part IV: Broader Implications and Future Development

Broader Implications of *Tone Perfect*

Standardization of audio asset production process

Standardization of the meta structure for Mandarin audio databases

Standardization of audio assets for empirical research and its reproducibility

Tone Perfect's Future Developments

Multi-syllable sounds in Mandarin Chinese

Native speakers in greater numbers

Other Chinese dialects

Other tonal languages

Future Developments

Hands-on Workshops

Collaborators beyond MSU

Tone Perfect as a shared digital resource for pedagogy, knowledge production, and dissemination

https://tone.lib.msu.edu/

Tone Perfect
https://tone.lib.msu.edu
THANK YOU !