When & Where: TBA

Instructors:

Professor: David R. Feinberg (He/Him/His) feinberg@mcmaster.ca

TA's: TBA

Office Hours: TBA

Course Content

Students will learn open science methods, how to record and analyze, and manipulate recordings of human speech and/or other vocalizations of human and nonhuman animals, as well as photographing human faces, learning morphing techniques, and testing perceptions of voices and/or faces. Students will learn transferable recording and photography techniques, spectrotemporal analysis, voice manipulations, and spectrographic representation of sound, as well as basic face morphing and analysis techniques. We will be analyzing voices and faces from an online open dataset, test if we can predict facial characteristics based on voice characteristics.

Registrants are expected to be familiar with research in voice and face perception.

This course is designed to help develop effective, transferable techniques among many facets of scientific research such as acoustic analysis and voice and face manipulation techniques. This course will be useful for any student pursuing a career in evolutionary psychology, perception, or clinical scenarios involving speech, voice production and/or face perception.

A laptop is not required for this course, but it is highly recommended that if you have one, you bring it to lab.

Required Readings

The required readings are articles and excerpts from both primary research literature and more elementary sources. Readings will be assigned weekly. Students are responsible for all of these readings, which, unless otherwise noted, can be accessed through the McMaster library. In the rare event that the reading is not available online, you may have to physically go to the library to find it.
Recording of lectures

Recording of lectures is permitted. Posting any lecture, audio recording, video, photograph, other similar media or any part of the course to the internet on public and/or private websites or apps is strictly prohibited and may result in automatic failure of the course.

Assignments and Grading

Assignments

There are two complimentary written assignments, both due on the last day of class,

• Create a mock pre-registration based on the OSF website.
  ◦ This can be submitted via avenue.
  ◦ We will work on this as we progress through the course.

• Write a report of their results.
  ◦ This is submitted as a word document via avenue.
  ◦ We will work on this during lab.

Students are expected to put their full name and student ID on all submissions so that we can clearly identify whose work it is.

Grading

Grades will be assigned on the basis of the preregistration and lab report. The preregistration is worth 60% of the grade, and the lab report is worth 40% of the final grade.

If you file acceptable documentation online with the McMaster Student Absence Form (MSAF) or with your Dean of Studies, contact your instructor immediately to figure out how to make up for lost work. For further information about missed work, medical exemptions, exam conflicts, and deferred exams, see http://mcmaster.ca/msaf/.

You may submit a maximum of 1 Academic Work Missed request per term. It is YOUR responsibility to follow up with your Instructor immediately (NORMALLY WITHIN TWO WORKING DAYS) regarding the nature of the accommodation.

If you are absent for reasons other than medical reasons, for more than 3 days, or exceed 1 request per term you MUST visit your Associate Dean's Office (Faculty Office). You may be required to provide supporting documentation.

Grades will be computed out of 100 points and converted to a letter grade as follows:

Required Readings
There is no textbook for this course. All readings are available either on the course website, on the University's Library Website, and Google Scholar.

Course Web Site
https://avenue.mcmaster.ca

Schedule of topics (subject to change)
Week 1 – The Replication Crisis and the Reproducibility Revolution
Readings:

Lecture
- Open Science Initiatives
- Preprints
- Preregistration
- Open Access Data
- Open Access Stimuli
- Reproducible Statistics

Lab
- Discuss methods for class project
- Create OSF Account
- Create Preregistration
- Start working on Preregistration
Week 2 - Recording voices & basic voice measurements

Readings

http://music.columbia.edu/cmc/MusicAndComputers/ • Chapters 1 & 2


Lecture

- Reading Review
- How is sound represented digitally?
  - Sampling rates
  - Spectrograms
- Bit depth
- Recording Voices
  - Microphone types
  - Signal to noise ratio
  - Clipping
  - What sounds do you record?
- Sound recording/Analysis software
  - Praat
  - Audacity

Lab

- Voice Lab Visit
  - What is a soundbooth
  - Acoustic foam
  - Record a voice
- Installing Praat
  - View a spectrum
  - View a spectrogram
Week 3 – Source Filter Theory & Pitch
Readings


Lecture

- Reading review
- Measuring duration, amplitude, and pitch
- Measuring Noise in the voice
  - Jitter
  - Shimmer
  - Harmonics to Noise Ratio
- Research on pitch, duration, & amplitude

Lab

- Measuring Pitch, Harmonics to Noise Ratio, Jitter, and Shimmer by hand
- Using scripts to measure Pitch, Harmonics to Noise Ratio, Jitter, and Shimmer
Week 4 – Formant Frequencies

Readings


Lecture

• Formant frequencies
  o What are they?
  o How to derive them
  o How to measure them
  o How to Estimate Vocal Tract Length
• Research on Formant frequencies

Lab

• Measuring formants by hand
• Using scripts to automatically measure formants
• Calculating vocal tract length estimates
Week 5 – Manipulating voices

Readings


Lecture

- How to normalize amplitude
  - RMS vs Peak
- Reversing Sounds
- How to manipulate pitch
- How to manipulate formants
- How to manipulate pitch and formants
- Applications of these manipulations in research

Lab

- Manipulate pitch
- Manipulate formants
- Combined manipulations
- Normalize amplitude
- Reverse Sounds
- How to do this by hand
- How to automatically script this
Week 6 - Putting it all together

Reading


Lecture
- Compiling the data
- Descriptive statistics
- Visualizing the data
- How to interpret the analyses we conducted
- Pitfalls, gotchas, and fixes

Lab
- Visualize data
- Compute exploratory statistics
- Reanalyze poorly measured voices based on findings
Week 7 – Photography for research

Reading

https://osf.io/us86m/
https://improvephotography.com/photography-basics/ (read full tutorial)


Lecture

- Taking Photographs
- Review of face research

Lab

- Trip to Feinberg lab to take photos
Week 8 – Symmetry and Sexual Dimorphism

Reading


Lecture

- Sex typicality of face shape
- Symmetry and Face Width to height Ratio

Lab

- Delineate faces
- Measure symmetry and Face Width to height Ratio
Week 9 – Face morphs and transforms

Reading


Lecture
- Morphs
- Transforms
- Caricatures

Lab
- Create averages
- Make transforms
- Make caricatures
Week 10 – Face and voice together

Reading


Lecture

- What (if any) is the relationship between voice and face?

Lab

- Creating face images based on voice (or other) characteristics
Week 11 – Analyzing Face Shape

Reading


Lecture

- Principle Components Analysis of face shape

Lab

- Principle Components Analysis of face shape
Week 12

Reading
https://cran.r-project.org/doc/contrib/Karp-Rcommander-intro.pdf

Lecture

• How to compile and analyze your data

Lab

• Compiling and analyzing your data
Week 13

Reading
https://lsa.umich.edu/sweetland/undergraduates/writing-guides/how-do-i-present-findings-from-my-experiment-in-a-report-.html

Lecture

- How to report your data

Lab

- Reporting data

McMaster University Statement on Inclusivity and Academic Integrity:
The University values integrity, inclusiveness and teamwork, and strives to support the personal and collective growth of the McMaster student community.

These values are foundational to ensuring campus environments – both in-person and virtual – are conducive to personal wellbeing and academic success.

Inclusivity and a Culture of Respect

As a McMaster student, you have the right to experience and the responsibility to demonstrate respectful and dignified interactions within all of our living, learning and working communities. Expectations are described in Code of Student Rights & Responsibilities

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students’ access to these platforms.

Additional information about the Code and netiquette can be found here
Academic Integrity and Honesty

As a McMaster student, you are expected to exhibit honesty and ethical behaviour in all aspects of the learning process. The academic credentials that you earn are rooted in the principles of honesty and academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, (e.g., the grade of zero on an assignment, loss of credit with a notation on the transcript which reads: “Grade of F assigned for academic dishonesty”) and/or suspension of expulsion from the university).

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy.

Some helpful information can be found here