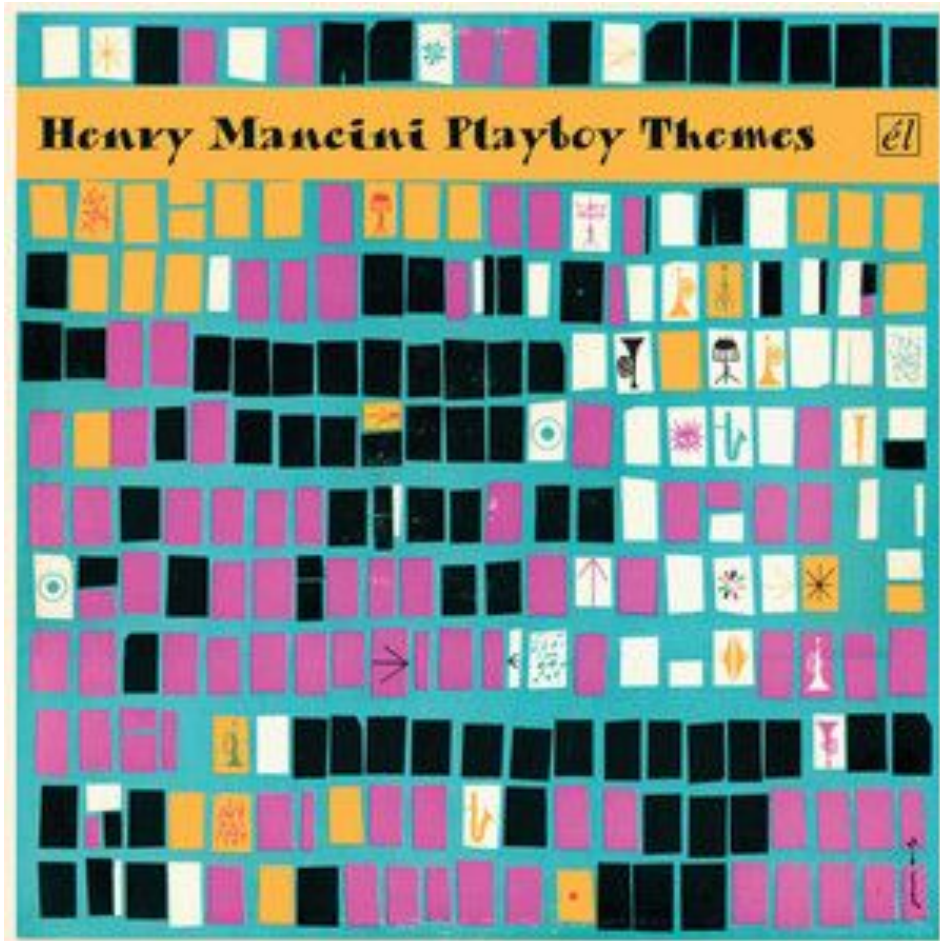


# What sets these two apart from each other?



tempo  
loudness  
instruments used  
(timbre)  
mood & feeling



# ALGORITHMIC ARIAS

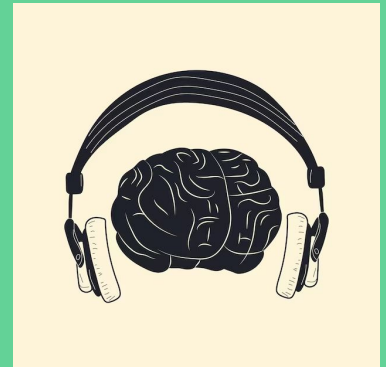
*Navigating the Melodic Maze between Music and the  
Brain*

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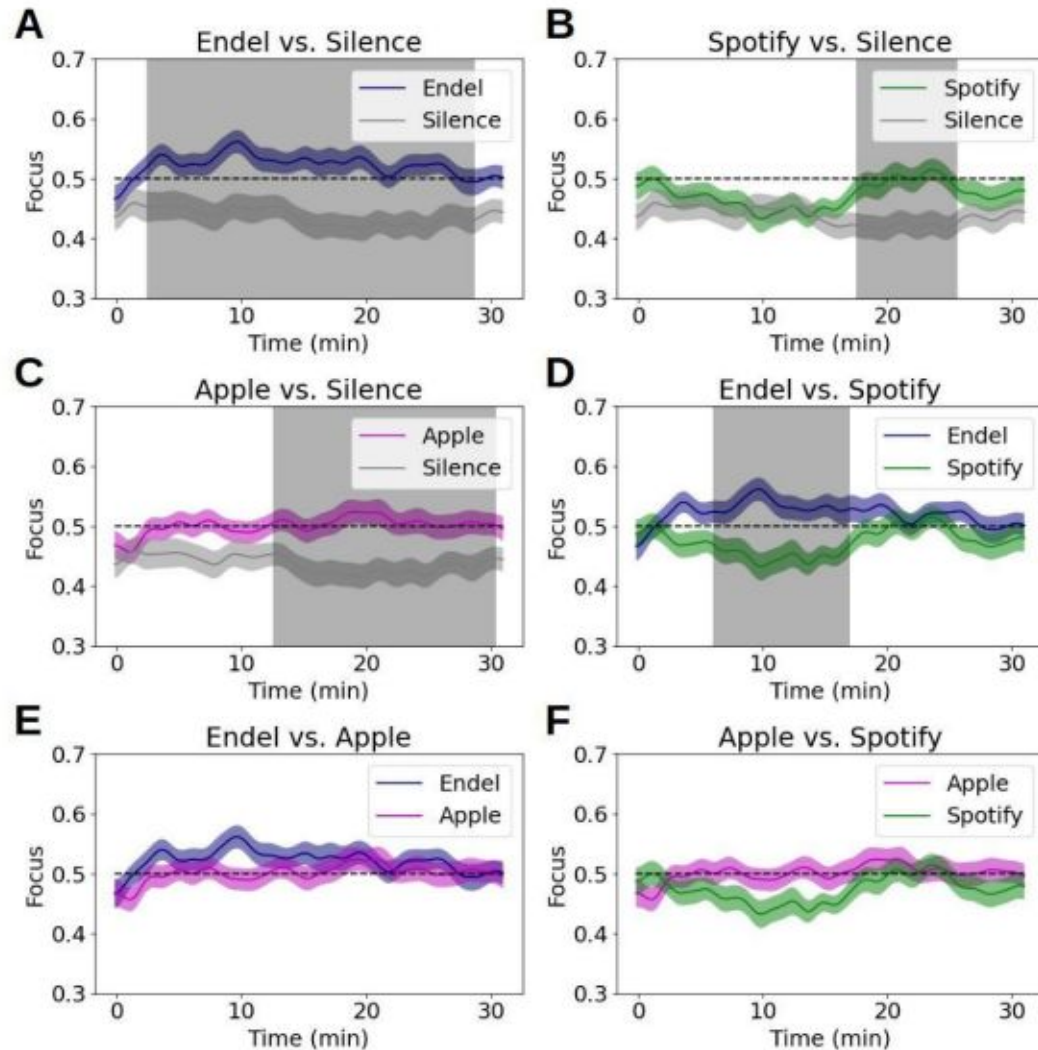
Advik Rai  
Period 3

# Research Question

How can algorithms predict the music a person connects to  
By using computer vision in conjunction with the knowledge  
of specific musical components, algorithms will be able to  
make reasonably accurate predictions for the kind of music  
the user will find enjoyable and generate such music to be  
tested.



# Background



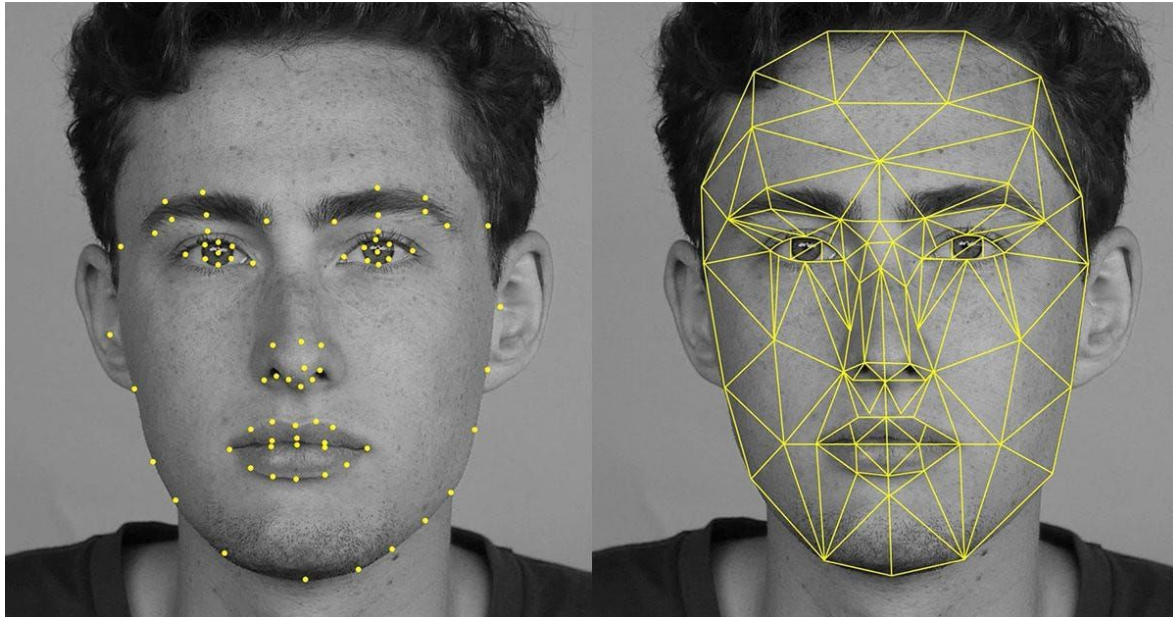
- Music is becoming popular as non-invasive medical intervention
- Algorithmic music affects your brain directly
- Real-time input highly personalizes this music for much stronger effects

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# Facial expression recognition

Analyzing facial changes to map the mental states caused by music

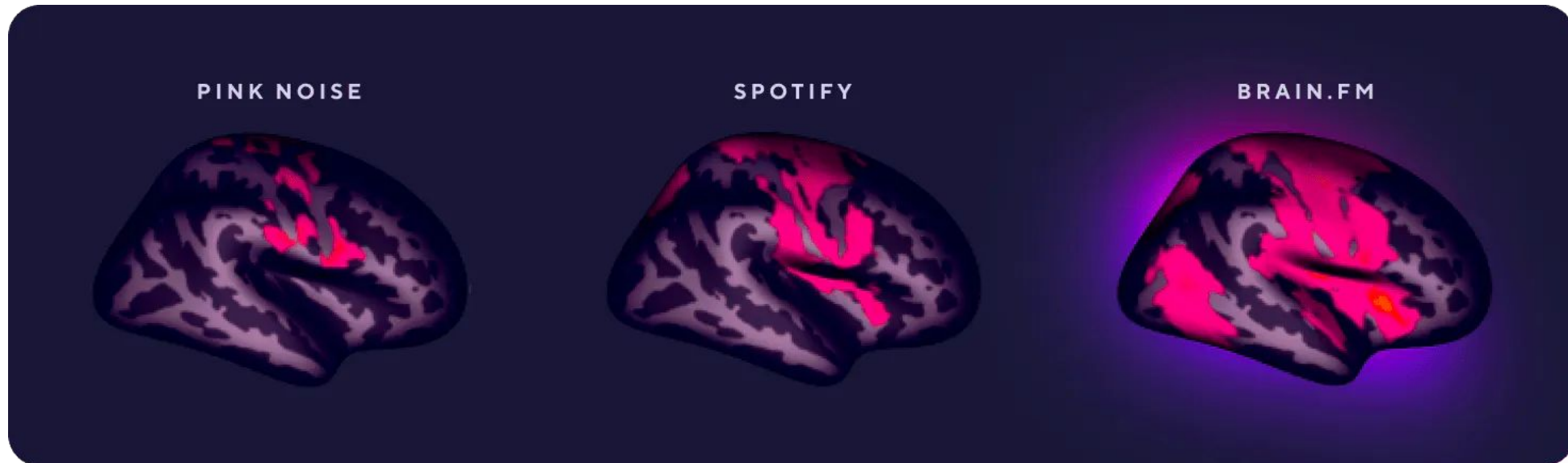


- Universal language
- Provides immediate feedback
- Free from bias and conscious manipulation (Weth et al., 2015)

# Neat facts

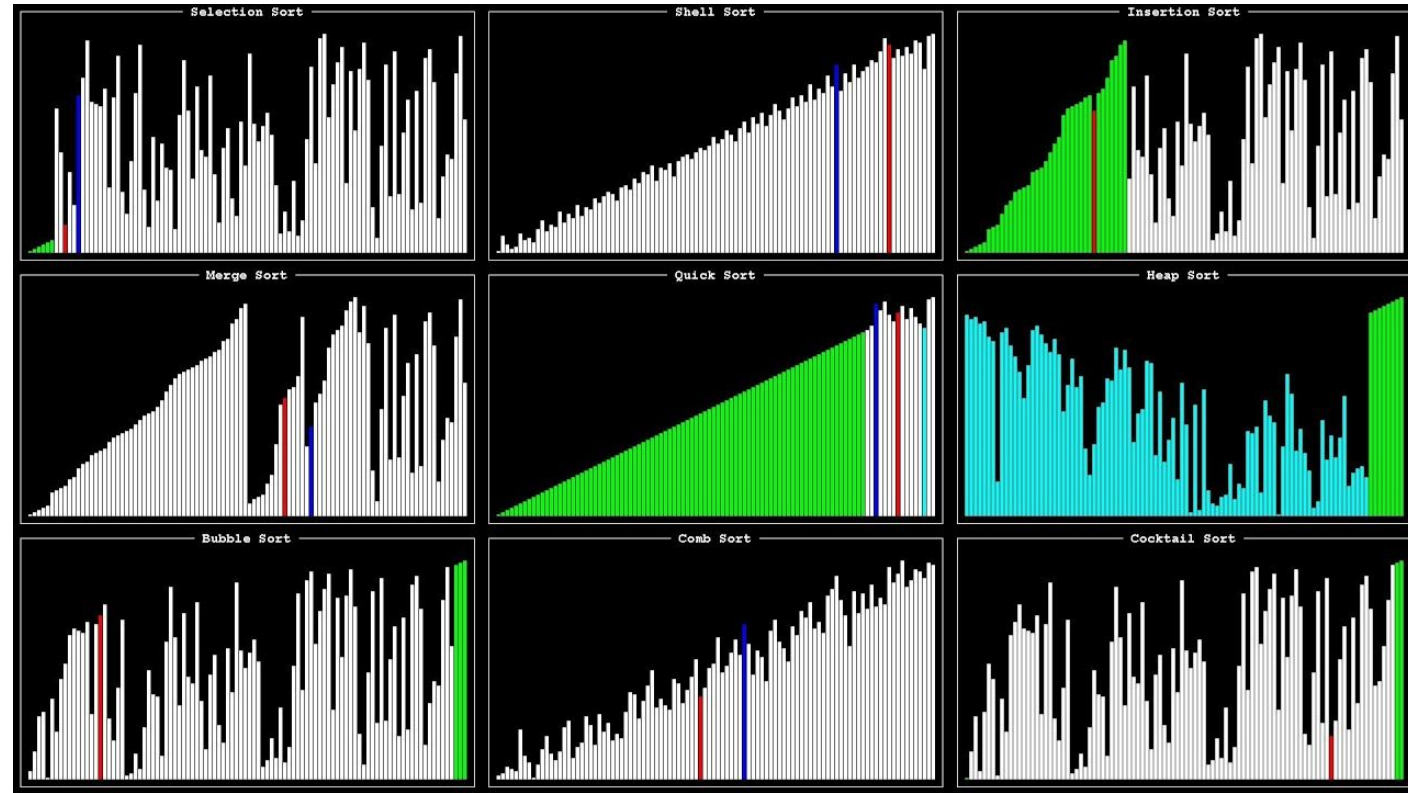
Benefits + undiscovered potential

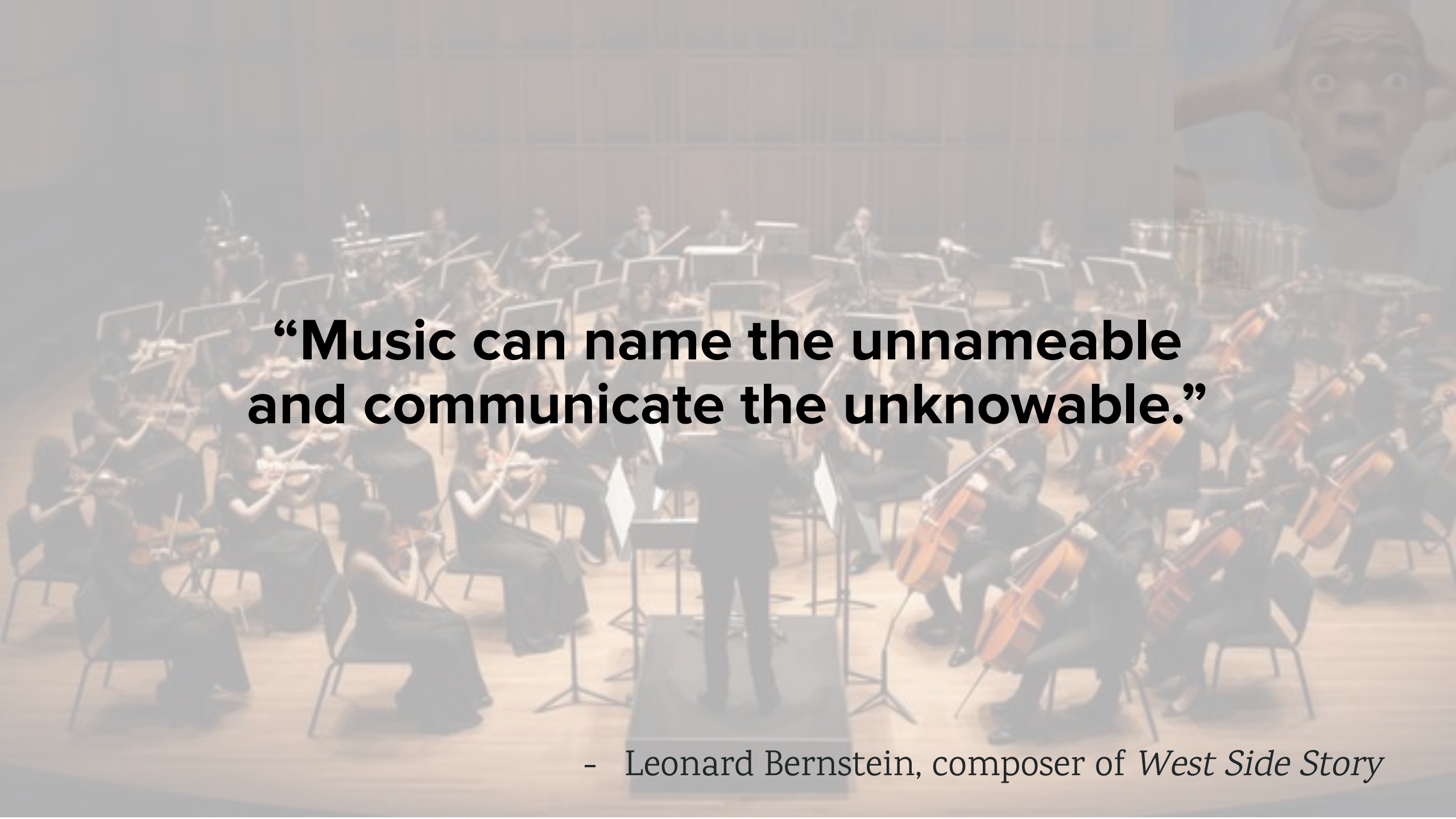
- Decreased ~4.4 mg opioids used in each of 4,968 surgical patients (Fu et al., 2020)
- Tailored music intervention reduced \$2,155 in expenses per patient (Chlan et al., 2018)



# Project + Data collection

- A prototype software
- Trials on volunteered test subjects
- Contacting experts for design and implementation
- Research paper





**“Music can name the unnameable  
and communicate the unknowable.”**

- Leonard Bernstein, composer of *West Side Story*



# Independent Research & Intern/Mentor Classes

- **Independent Research** class

- *Design an original college-level research study*
- *Awesome in-class community*
- *Communicate your achievements to professionals*
- *Get connected with experts in your field of interest*

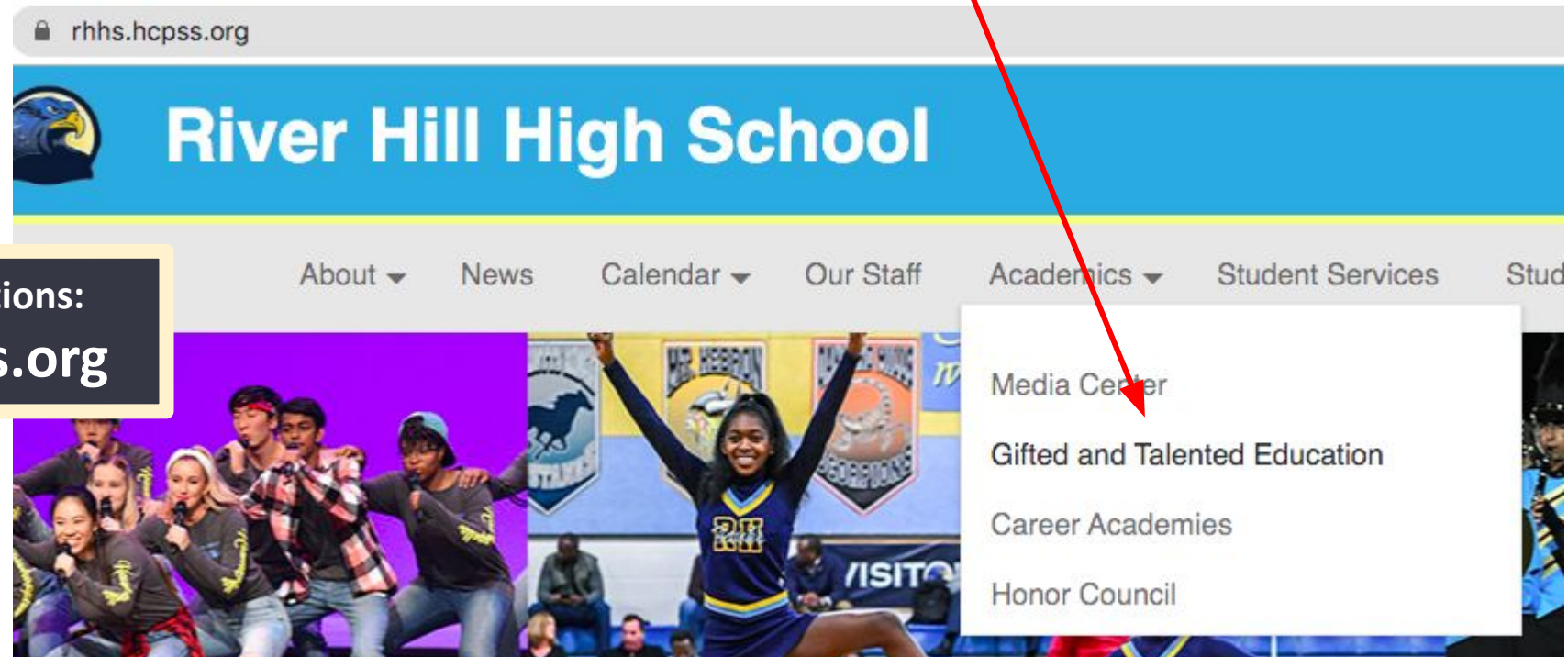
- **Intern/Mentor** class:

- *Go to an internship or mentor every week during school*
- *Direct communication with mentors and professionals*
- *Real life skills in a professional environment*
- *Looks great on a résumé or transcript.*

# To apply to the GT Advanced Research Program for the 2024-2025 school year:

- Go to the RHHS Website
- Select Academics -> Gifted and Talented Education
  - You will find the applications for Intern/Mentor and Independent Research
  - Applications are due on **Friday, January 26**

Email Ms. Sharbaugh with any questions:  
**Janine\_Sharbaugh@hcpss.org**



# What if Drake could heal you

