

CS 147: Art and Culture Studio

Assignment 2

POVs and Experience Prototypes



Amy Bearman, Kevin Coelho, Hieu Minh Pham

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PROBLEM DOMAIN

The problem we are tackling is music creation and composition. We are specifically targeting professional musicians and composers, who need a quick, easy, and on-the-go way to record (in writing) their musical ideas and transcribe them to a music score.

LAST WEEK'S POVs

Music is hard -- to learn and compose. We wanted to make music more accessible, especially for people with little to no formal training. We wanted to increase access to instruments (especially by transforming users' iPhones into "instruments"). In doing so, we hoped to change our interviewees' feelings of guilt or inadequacy into excitement and positive encouragement.

Julio

We met Julio, an ex-military sergeant, late 20's marketing school student living in San Francisco.

We were amazed to learn that this person with so much leadership experience, who is generally very self-confident, could be so embarrassed and unsure about his musical skills.

It would be game-changing to put him in an environment where he can interact (and possibly compose or perform music?) with other people at his musical level.

Mike

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Michael

We met Michael, a 19 year-old Stanford student who sings in Gospel Choir and is a self-taught violinist.

We were amazed to learn that he taught himself how to play violin.

It would be game-changing to allow him to continue pursuing music at a higher level without a huge time and money investment (e.g., lessons, instruments, equipment).

ADDITIONAL NEEDFINDING

To further test our POV, we went back into the field. Below are the key findings from four more interviews.

Sample Questions

- What is your background in music?
- What was the most important lesson you took away from a composing class?
- For beginners:
 - What are some barriers for you to start composing?
 - Have you used any music-related apps? What do you like/dislike?
 - **With your current skills and knowledge, if I asked you to compose a song right now, how hard does that seem to you?**
- For more advanced:
 - What is your composition process? What is the hardest part?
 - What composition software do you use? What do you like/dislike?
 - If you could imagine a phone or tablet app for composing, what would it look like, and what features would it have?
 - Would you prefer to compose on-the-go or in an existing studio?
 - Would you consider integrating projection or VR technology into your studio space?
 - Can you tell me about a time that you had inspiration in composing or arranging? Walk me through that process end-to-end.
 - Is collaboration important to your process?

Interview #1: Jacob Bearman



We met Jacob B, a 17 year-old high school boy on the autism spectrum with ADHD, who wants to teach himself music but doesn't have the mental bandwidth to start from scratch.

We were amazed to learn that there is both a very high skill gap and a cost gap for someone who is just getting started in music and wants to continue. Jacob described it like "you're going from a Toyota Prius to a Ferrari Spider. One is very easy to drive and gives you a lot of assistance."

It would be game-changing to make him a video game for music that has the right balance between fun and learning.

Interview #2: Malcolm Campbell



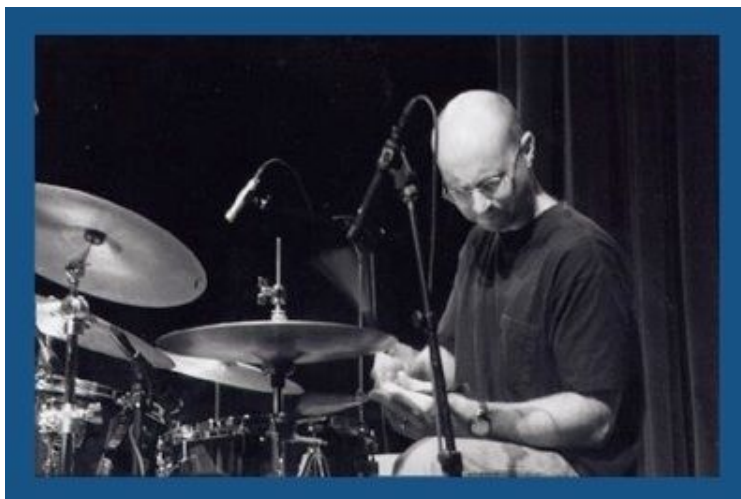
We met Malcolm, a graduate of Harvard and the New England Conservatory, working towards

a PhD in Neuroscience, and who has performed at incredible venues such as Carnegie Hall and the Montreux Jazz Festival.

We were amazed to learn that playback wasn't an important feature for him on a music composition app. He can hear what he's composing in his head, and he thinks the playback on software like Finale is artificial and inhuman sounding. Malcolm says he has better ideas away from the piano because at the piano he tends to overwork his fledgling ideas and obsess over getting them to be perfect.

It would be game-changing to give him an on-the-go tool where he can record his flashes of musical ideas without forgetting them later, and without the pressure of sitting down at a piano and "obsessing" over it.

Interview #3: Jason Lewis



We met Jason Lewis, who has a BA in Music from SJSU, 30+ years of performance experience in the Bay Area, and who has performed in the soundtracks for the Godfather 2 video game and in the movie *Ratatouille*.

We were amazed to learn that he gets musical inspiration from everyday noises like the sound of his feet on a hill when jogging. Jason also writes for his wife, a conductor, and the various ensembles she works with. Unlike Malcolm, playback on music software is very important for Jason so he knows what he is entering into the computer is the right thing. For Jason, composition is a very long and drawn out process.

It would be game-changing to create an app that could listen to Jason's playing and

transcribe it for him.

Interview #4: Davorious Branimirius



We met Davorious, who has numerous degrees in composition: a BA from the University of Graz, a MA from University of Stuttgart, and is pursuing a DMA at Stanford. He has studied with famous composers and is a professional composer himself.

We were amazed to learn that he sometimes takes days or a week to translate his theoretical ideas into musical notes.

It would be game-changing to create a visual tool for translating his structured ideas into musical notes.

THREE REVISED POVs (and sample HMWs)

1. **Jacob needs a way to learn music that is the right balance between fun and learning.**
 - Build a tool that captures the most common patterns and idioms in conventional music creation software in a more HCI friendly manner than the current system?
 - Game-ify music education in order to break it up into fun, manageable, bite-size pieces?
 - Replace Candy Crush and similar with a more creatively fulfilling alternative?
 - Turn the ubiquitous iPhone into a musical instrument?
 - Build a social environment in VR that people can join anonymously and share their musical performance.
2. **Mike needs an easy and quick way to learn music.**

- Find a better way to visualize music than the traditional staff and notes approach, which would be unreadable by people who don't know how to read music, and would not be easy to work with on a small iPhone screen?
- Take advantages of other senses for learning musics (i.e body movements, taste, visual, tactile) so that users learn music in a more natural ways.
- Abstract musical concepts like note symbols, chord symbols, time signatures, and key signatures so they are easier to understand?

3. Malcolm needs an on-the-go tool to quickly jot down musical ideas.

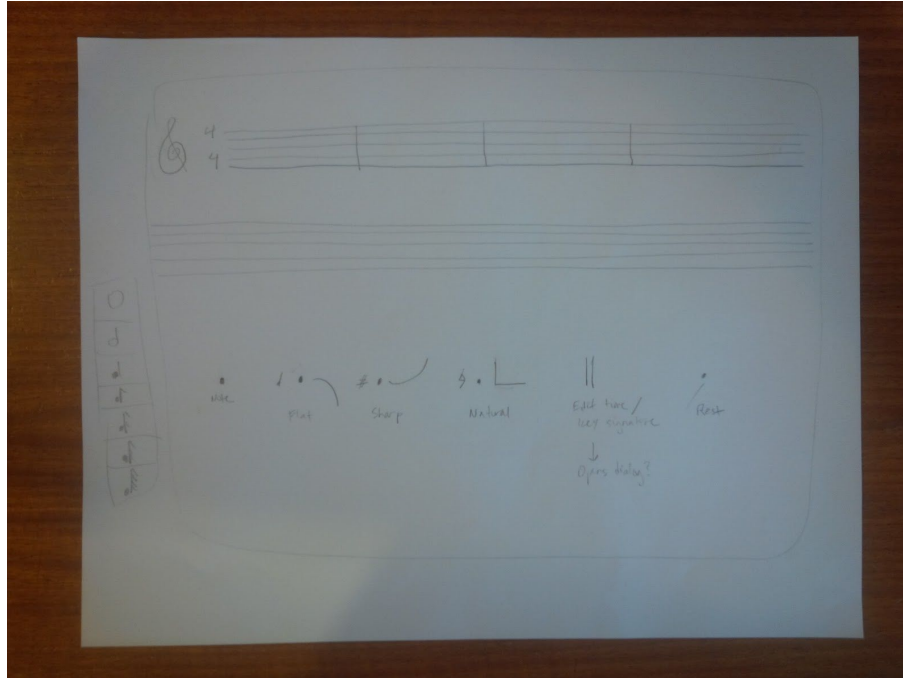
- Build a tool for composers to record their musical ideas?
- Convert touch gestures (e.g., pinch, tap, double tap, pan, swipe) into meaningful musical symbols, sounds, or effects?
- Make a better interface for creating chord progressions than a series of drop-down lists?
- Transcribe music played on an instrument onto a paper score?
- Increase the speed of entry of notes and chords on music composition software?
- Turn iPhone to a device that allows functions like creating loops, changing frequencies of sounds or record everyday sounds to make musics with natural interaction.
- Suggest/finish the piece without having the composer write the whole thing for quick idea-recording

3 best HMWs

1. **(POV #1):** How might we make playing music easy and fun?
2. **(POV #2):** How might we visualize music other than traditional staff and notes?
3. **(POV #3):** How might we build a tool for composers to record their ideas?

EXPERIENCE PROTOTYPES

1. **A music composition iPhone app for composers.**



Assumptions

- The user will have an iPod / iPad (depends on user)
- The user has prior composition experience (depends on user, valid for testing)
- The user will find the gestures intuitive (valid after testing)

Prototype Creation

The prototype was created to be as simple and intuitive as possible. The basic display includes staff paper and a help menu containing sample gestures that the user can do to enter notes, chords, and articulations. The user can select a note length and enter it by touching any valid location on the staff and the note will be created. Alternatively, the user can select a note and draw stems or flags to manually change the note duration. Gestures were chosen to be intuitive and visually correspond to how a user might actually write music on paper. For example, to “sharp” a note (make the note higher in pitch), a user would start with the note and gesture right and upwards as if to make the note “slide up”.

Testing the Prototype

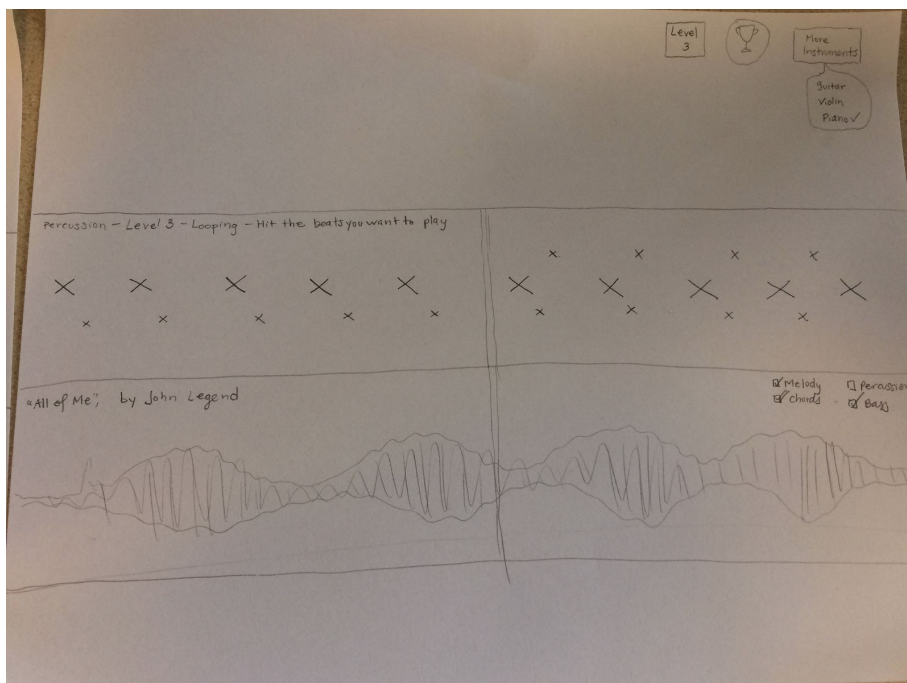
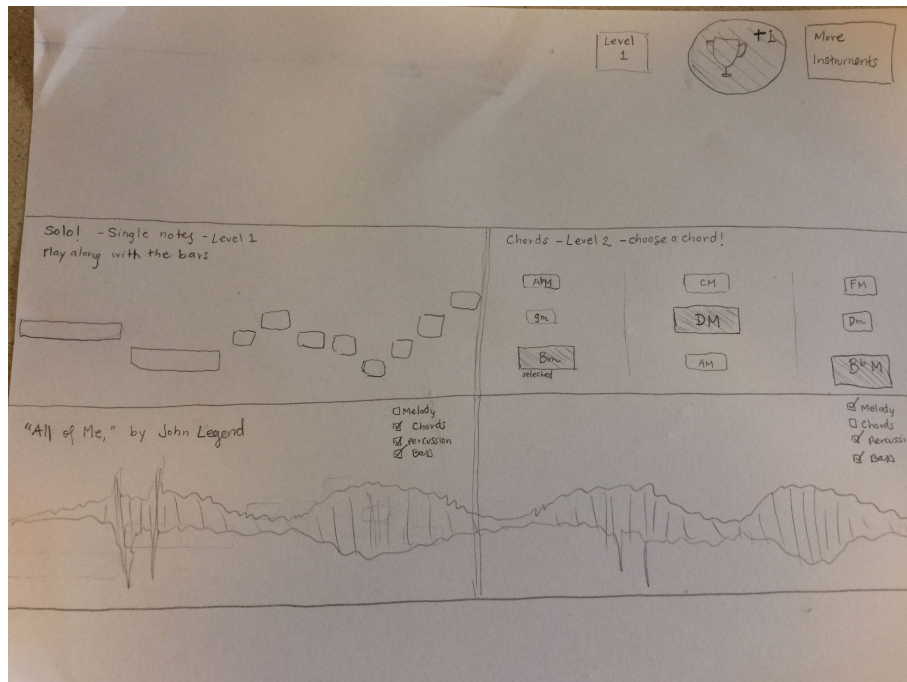
The prototype was tested on Diego Hernandez, who is a very experienced classical musician, arranger, and directs the Stanford Collaborative Orchestra. Diego was given very simple instructions and shown the basic gestures for note entry. Diego immediately began using his finger on the sheet of paper and asking lots of questions about more features. He learned the basic gestures very quickly and didn’t need any reminders about what they were.

What worked? What Didn’t?

The simplicity and speed of entry worked very well for the prototype. However we had come up

with no system for arranging different scores or parts. Diego commented that he would prefer a larger system for more complicated arrangements with many instruments and parts, but for quick ideas this app was very useful. Our assumption of a quick and easy use case was valid. The product could be improved if a more complete feature set were implemented for note entry and for organization of scores and individual parts.

2. A music creation iPhone app for music novices.



Assumptions

- The user will have to have an iPhone or iPad (**VALID after testing**)
- The user will think the game is fun, and even want to keep advancing through levels (**VALID after testing**)

How did you make the prototype?

We made a paper prototype of an iPhone app for music composition. The app had different levels (e.g., playing along with a melody, improvising your own melody, playing chords, and playing percussion). Different levels were visualized in different ways, that suggested traditional music notation but could be understood by someone who had no knowledge of music.

How did you test the prototype?

We tested this prototype by giving it to Jacob B., and watching him interact with it. In the background, we played the key song being played in this particular freeze frame of the app: “All of Me,” by John Legend. We played the instrumental version of it, so the melody was lacking. Jacob interacted with the app by “pressing” buttons; when he pressed a button, we played on the piano the appropriate note or chord.

What worked? What didn't? What did you learn?

Jacob liked the first level of the game (the melody level): he thought it was intuitive and reminded him of Guitar Hero or other video games he had played. He also liked that colors signified different notes. This especially helped him understand that the same note at different octaves is “the same note” (something that had seemed overwhelming with the piano’s 88 different keys). He also wanted to be certain that there were other songs that might appeal to him, besides just the John Legend song. He especially wanted Japanese vocaloid songs.

Jacob was confused about the chords (he didn't know what “B-flat M” meant, for example). He wanted something more visual instead. He also didn't know what the x's meant for the percussion level, but thought it would be more intuitive if he was actually playing it. Jacob's overall takeaway was that he would be really interested in the app, but thought it would be difficult to convince his mom that it was a worthwhile use of his time, not just a video game. He was also concerned that the skills he learned might not transfer over to the piano, and he really wanted to learn to play the piano.

New assumptions after testing

- The user will have to know the basic way to write a chord (**INVALID after testing**)

3. An AR app for music creation



Assumptions

- Visual guidances (color pointer) help people learn/make musics faster (**VALID after testing with simple song**)
- These visual guidances could be helpful for professional musicians (**INVALID after testing, they still prefer music sheet**)

How did you make the prototype?

We made a paper prototype of an AR display to test how physically-visual guidances can be a quick way of learning music. We imagine that users will wear an AR headset, and inside this mixed reality view, there are colors blocks falling down from the top to piano keys to indicate which keys should be played. We divided the notes into 3 different priorities, where each priority are represented by color sticky notes:

Red - 1st priority; notes need to be play at the moment.

Orange - 2nd priority; notes need to be play after red notes.

Light Green - 3nd priority; notes need to be play after orange notes.

After users played the key under the red blocks, those blocks disappeared and orange blocks turned red, light green blocks turned orange, and new light green blocks appeared. We chose those colors because red is really recognizable, and the other colors are only bright enough to let users know which keys should be played next without distracting them.

How did you test the prototype?

We asked the user to sit down at the piano, and we placed the sticky notes on top of piano keys. After he hit the key, we removed the sticky notes and changed it to different colors as described above.

What worked? What didn't? What did you learn?

The color coding helps users to easily recognize which notes are going to be played next without looking at the music sheet. The sheet can be complex that users forgot where he were when he looked at it. However, the color blocks need to appear and disappear at very precise rates (to follow the song), thus they work better with simple songs, while complex songs with fast tempo can be challenging.

New assumptions that emerged

Visual guidances in AR Set can be a tool for amateurs who want to learn basic songs.

BEST PROTOTYPE: A music composition iPhone app for composers.

We decided the best prototype was the music composition app for a few reasons. First, the prototype is incredibly simple, intuitive, and a very useful tool for composers. To our knowledge, there is no score creation mobile app that uses gestures to enter notes. Our first prototype tester found our sample gestures to be very easy and intuitive and he proceeded very quickly to jump right into writing down the opening line of a Bach quartet that he knew. In this sense, our composition prototype succeeded in doing exactly its intended purpose - a quick entry composition tool for composers on the go to jot down ideas.