

CS 147: Art and Culture Studio

Assignment 8

Hi-Fi Prototype Writeup



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12/9/2016

1. HEADER

1 (a) Mission Statement / Value Proposition



allegro

Compose anywhere.

Our mission is to make composing fast, mobile, and intuitive for experienced composers. We want to provide a highly portable mobile app that can serve as a replacement for carrying around music paper for composition and contribute to the compositional process in ways that paper cannot.

2. PROBLEM / SOLUTION OVERVIEW

Different composers have different needs. From our previous interviews, we found that some composers require playback of what they are composing while others do not. Some composers have more abstract concepts for pieces they are composing while others stick to more concrete musical ideas as a starting point. All composers we talked about described certain moments in their life when they would be struck by inspiration either by searching for it or naturally coming across it. It is these moments we'd like to capitalize on and create a tool allowing composers to document quickly their ideas while their inspiration is fresh.

To this end, we developed a fast and easy way for composers of all levels of experience to quickly notate and share ideas.

allegro

NEW COMPOSITION

EDIT COMPOSITION

INSTRUCTIONS

3. TASK & FINAL INTERFACE SCENARIOS

3 (a) Simple Task

Compose

Composition is the most basic and primary function of our app and is our simple task. Allegro allows users to create notes and chords using simple, intuitive gestures. It is the primary purpose of Allegro to make composition simpler, easier, and faster.

Slide out menu from the right

Fur Elise

The image shows a musical staff with a treble clef and a key signature of one sharp (F#). The first measure contains a whole note chord consisting of F#4, A4, and C#5. The second measure contains a whole note chord consisting of D5, F#5, and A5. The third measure contains a whole note chord consisting of F#4, A4, and C#5. The navigation menu on the right is purple and contains the following sections:

- Navigation:** Home icon, Layers icon, PDF icon.
- Mode:** Music icon, Book icon, Eye icon.
- Signatures:** Treble clef icon, 4/4 time signature icon.

Enter key signature menu

ENTER KEY SIGNATURE

The key signature menu is a pink bar with the text "ENTER KEY SIGNATURE". Below it is a white box with a black border containing the following elements:

- A vertical column on the left with a sharp symbol (#) and a flat symbol (b).
- A central area with three sharp symbols (#) arranged in a triangular pattern.
- Text at the bottom: "A Major / F# Minor".
- A purple button on the right with the text "DONE".

Enter time signature menu

ENTER TIME SIGNATURE

2	2
3	3
4	4
6	6
8	8

DONE

3 (b) Medium Task

Share

Sharing music is a key function of our app and we wanted to make it easy and quick. A key reason to write music using software in general is portability and making it accessible for musicians to play and for people in general to see.

Cancel	Sending you my latest composition, Fur Elise	Send
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To:

Cc/Bcc, From: amy@hyperfine.com

Subject: Sending you my latest composition, Fur Elise

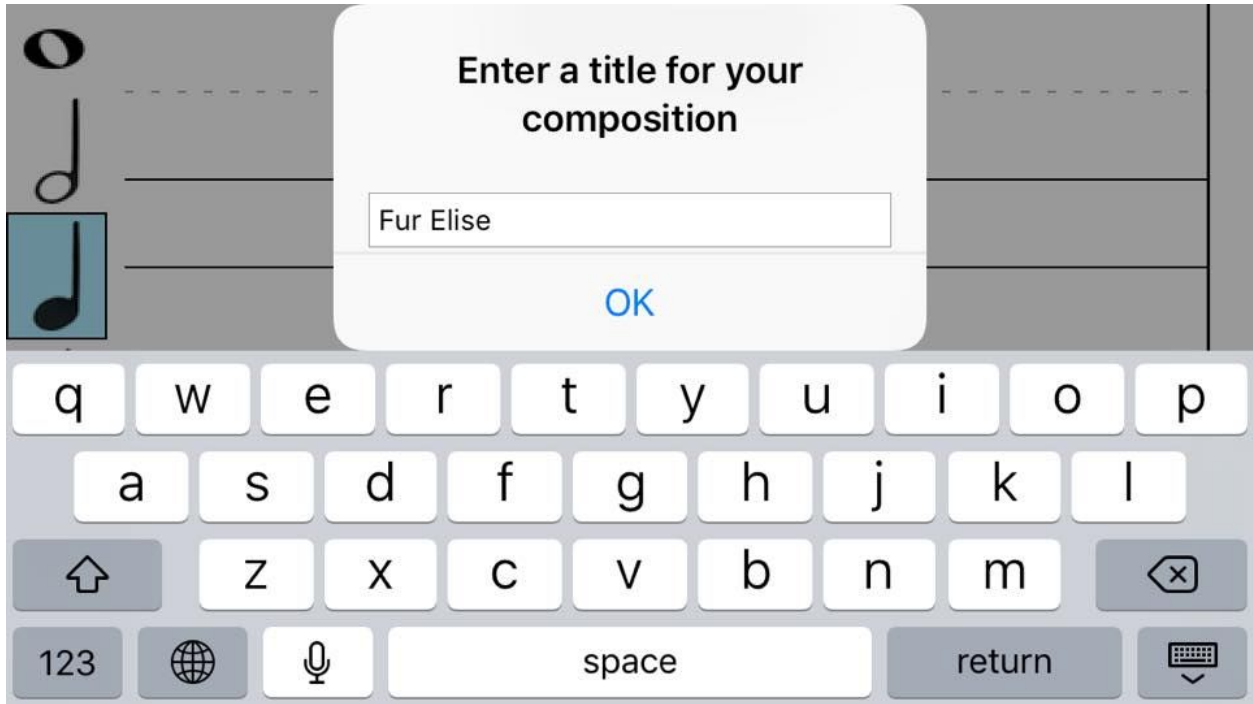
Let me know what you think!

Sent from my iPhone

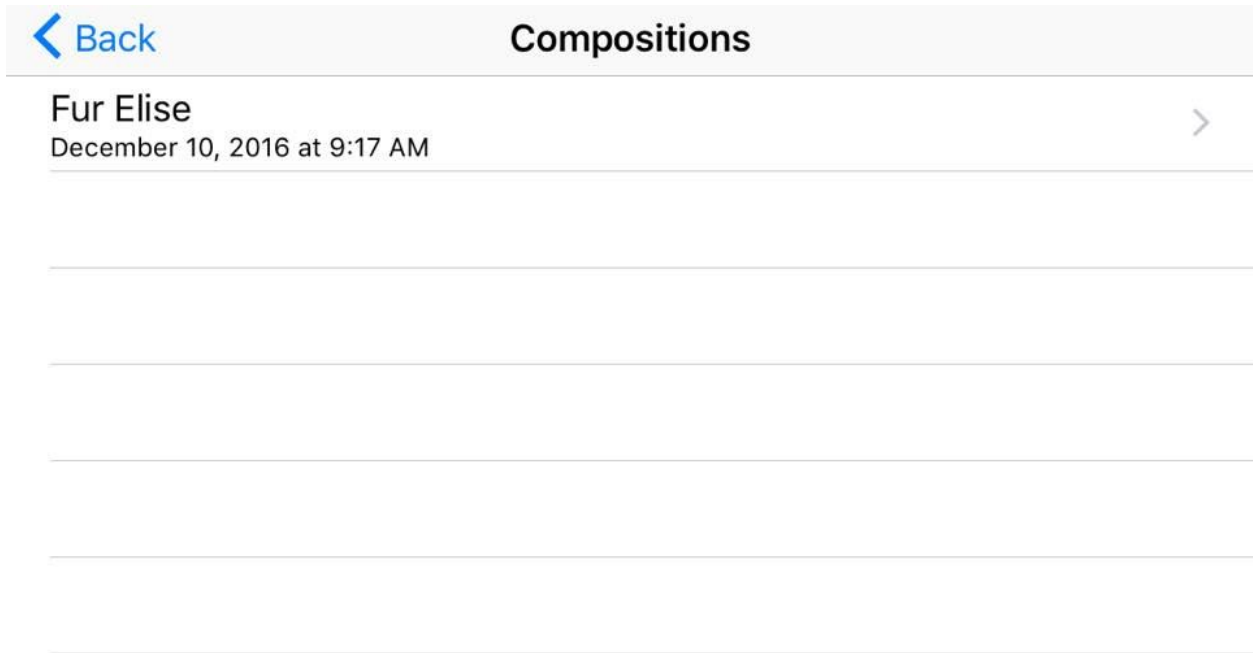
3 (c) Complex Task

Edit

In order to compose a more complete score, composers need to be able to separate out different parts for different instruments and overlay them onto a single score. Our primary focus for the first version of this app was to address the issue of speed and ease of entry for notes - so we modified this third task to better implement creation and saving of new scores instead of overlaying multiple parts. More arrangement features will possibly be implemented in future versions of our app. Currently, this task takes the form of easily saving and re-opening multiple compositions.



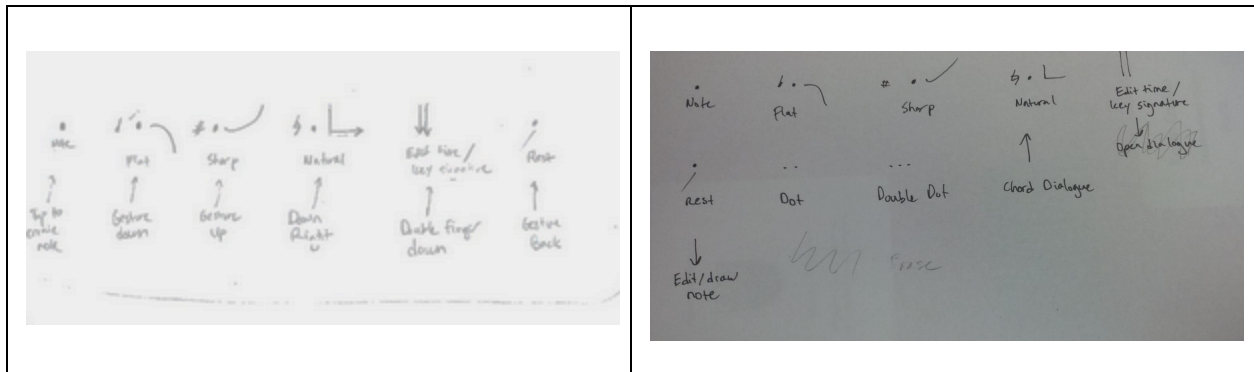
View current compositions



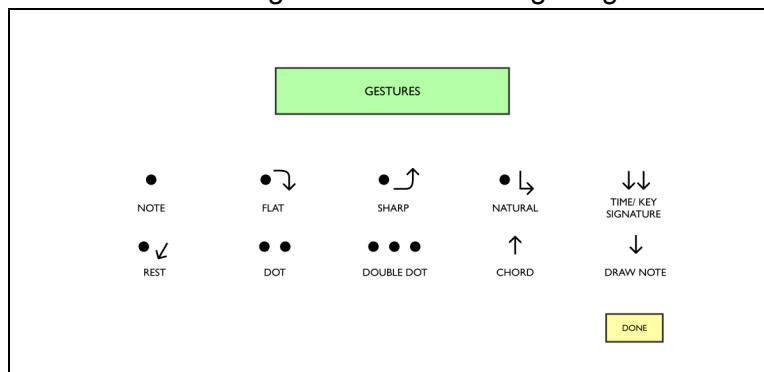
4. DESIGN EVOLUTION

Gesture Instructions:

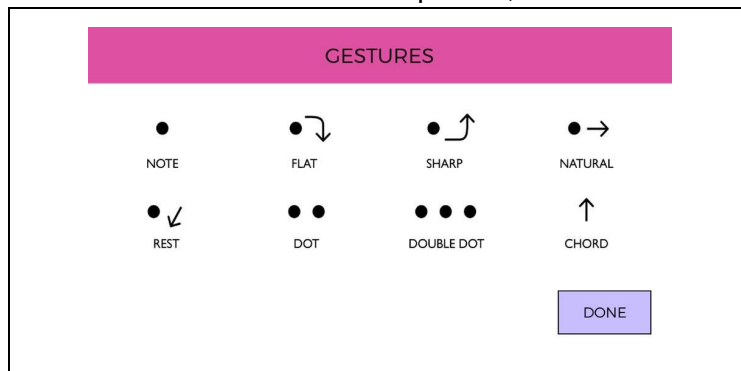
Initial gesture drawings were mostly kept after receiving highly positive feedback from users. Edit time / key signature was abstracted out into a separate navigation as a pullout tab, and edit / draw note was removed as a feature since it took too much time and did not add much benefit to the app. Removing this feature also simplified the process of entry to its most efficient and simple state.



Version two - high resolution drawings of gestures

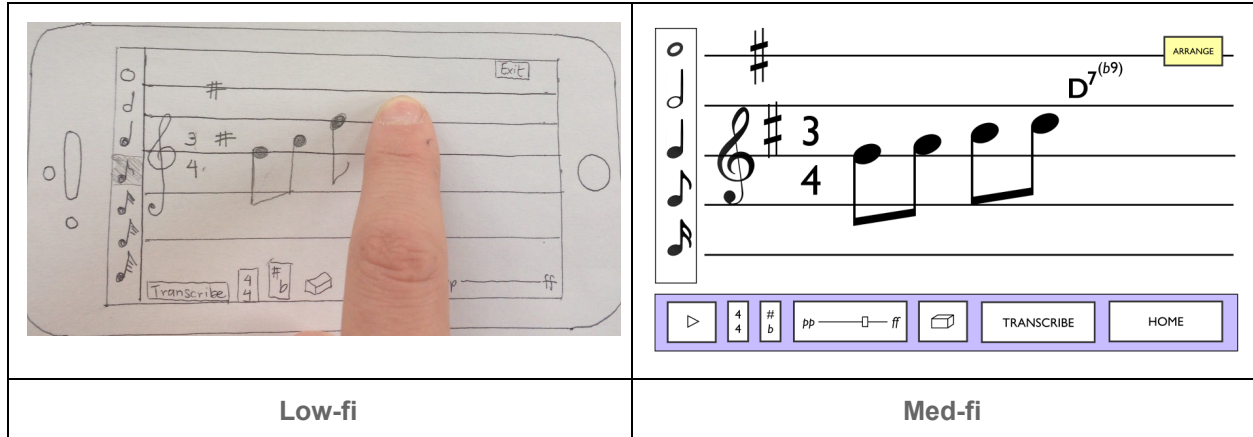


Version three - header and buttons updated, extra features removed

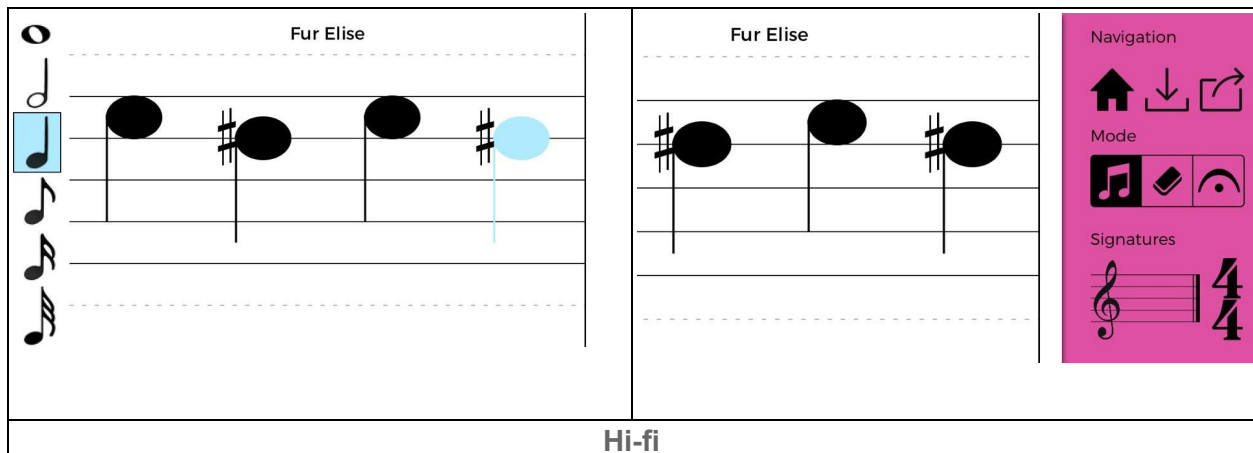


Task 1: Compose

The main composition screen was dramatically changed from start to finish. Initially it had two menus to allow for certain features which we thought to be important for the home screen. Due to user feedback and the “fat fingers” issue, the final result abstracted out most features into sidebar navigation or removed them completely. The final result was much cleaner and easier to use.



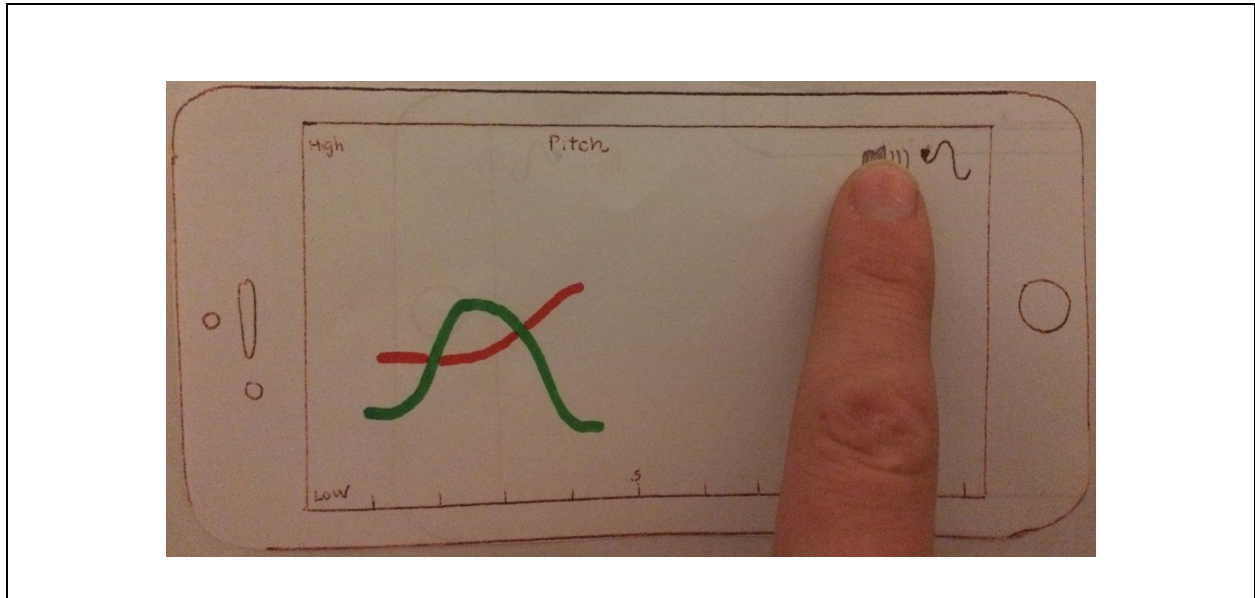
From v1 to v2 removed lower menu bar, made notes and staff much larger to accommodate easier note entry and accuracy. Erase mode moved to side NAV, time and key signatures moved to side nav, export, save, home buttons moved to side nav.

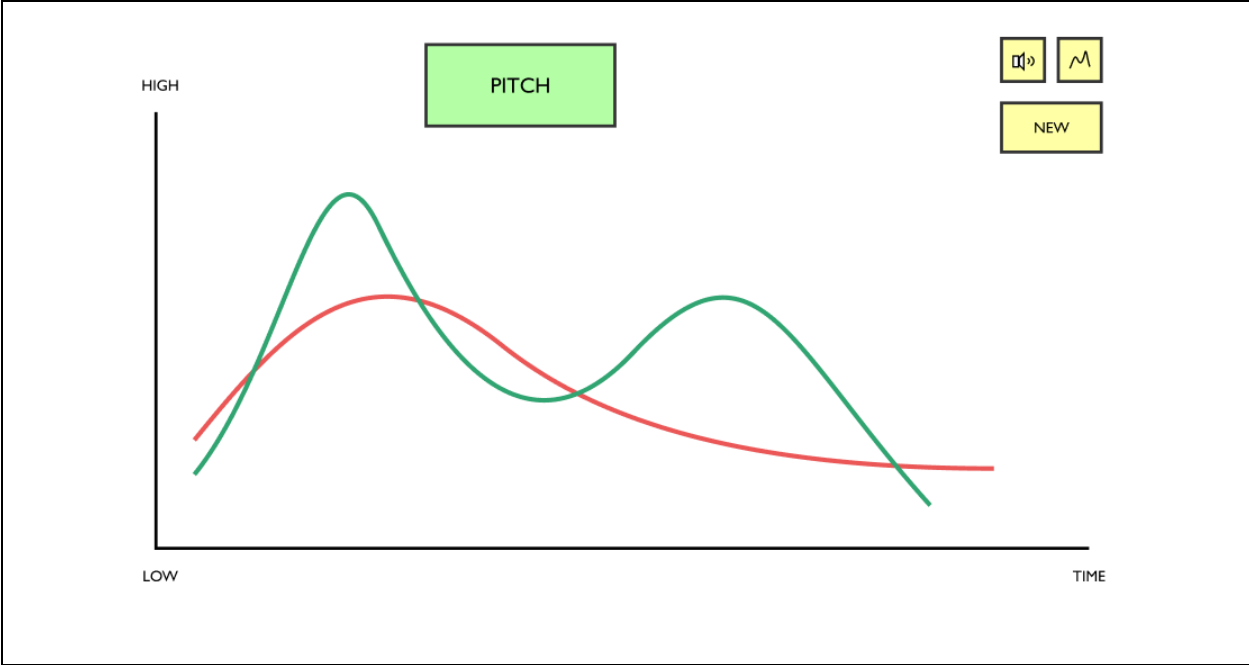


Task 2: Arrange

Our task 2 went through some significant changes throughout the process. Initially we presumed that a composition app would need functionality for accommodating multiple instruments and multiple parts, as most current composition softwares do. However when talking to users, we found that quick and easy entry was a higher priority especially for the overall design of the app. So instead of focusing on creating multiple instrument parts, we changed our second task to involve easy sharing and collecting of multiple compositions of one part each.

We also experimented with different methods of visualizing parts and eventually found them to be unhelpful to users who were mainly interested in the core feature set of composing quickly and sharing.





Pitch visualization was removed in the final version in lieu of a very simple list for keeping track of existing compositions for editing / saving.

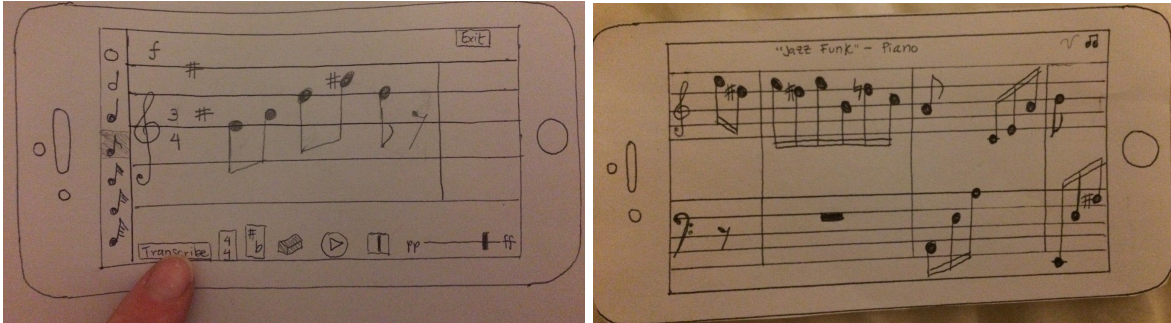
[< Back](#) **Compositions**

Fur Elise >
December 10, 2016 at 9:17 AM

Task 3: Share

Our third task was fairly straightforward and didn't involve too many changes besides UI / UX changes in order to make the share task easy to find and straightforward. In the final version, share is a simple export button that by default sends an email with a PDF attachment. In future versions, share may include more options to use the native share functionality with ability to attach a PDF to a variety of messagers / sharing options.

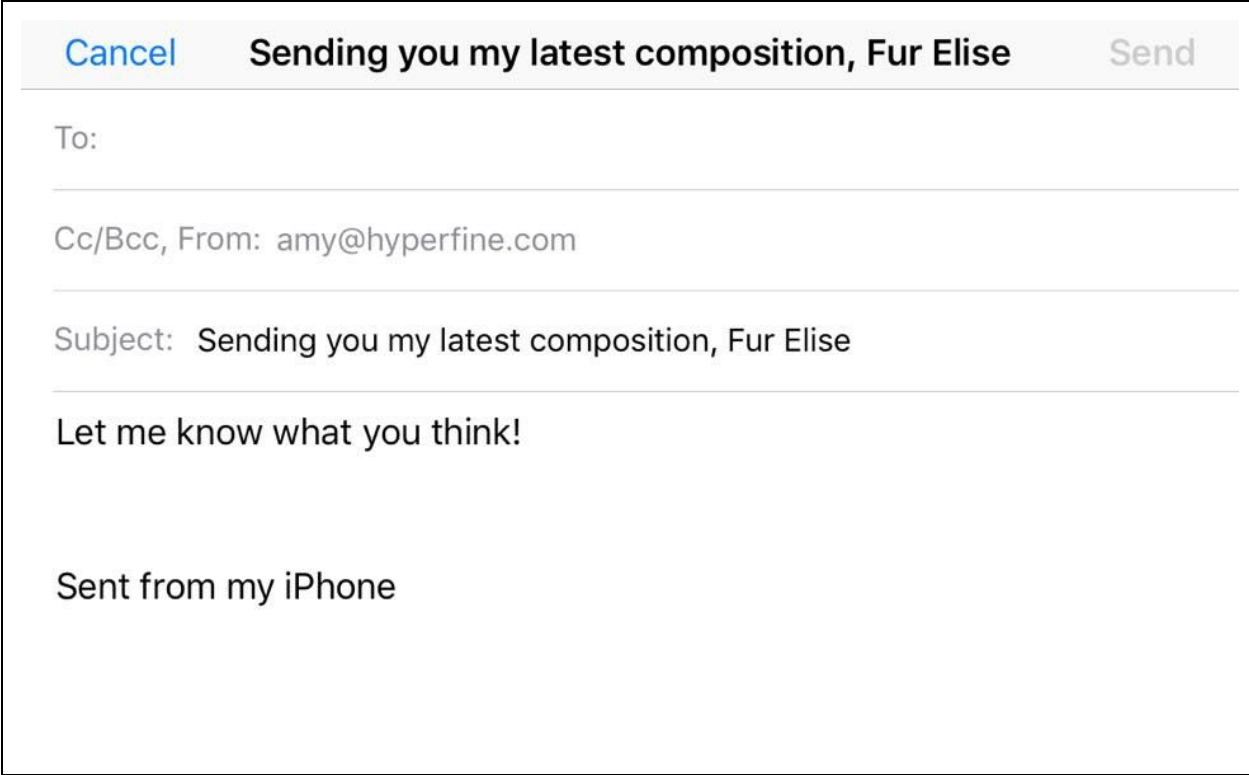
Fig 2.34: Transcribe composition to PDF



Version two removed the display of the pdf and showed a simple popup to indicate that a PDF had been created.



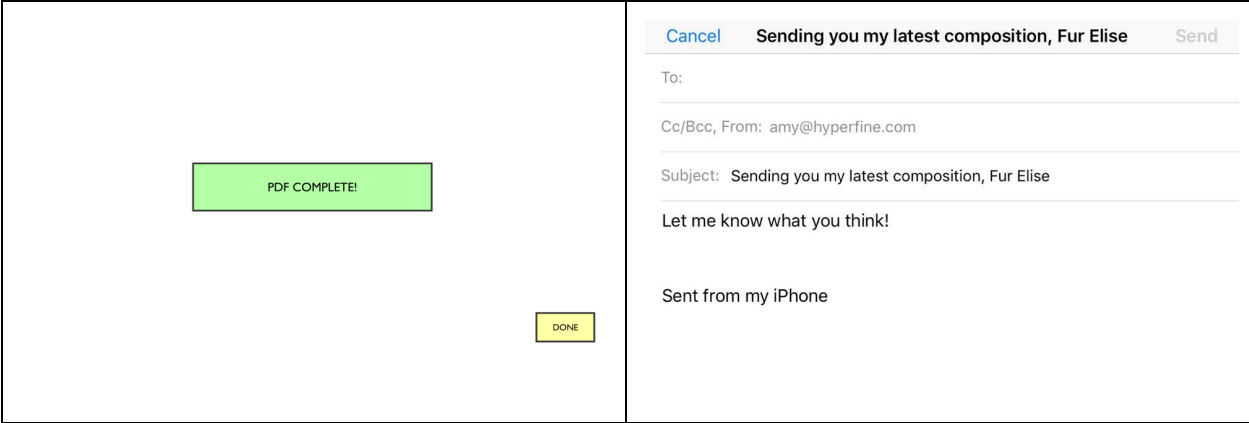
Version three compacted the whole process into a single "share" with the app automatically opening an email to send the pdf. In future versions, this would have flexibility for using other messagers.



5. MAJOR USABILITY PROBLEMS ADDRESSED

1. **[H2-3 User Control and Freedom] [Severity 3] [Found by: A, B, C]**

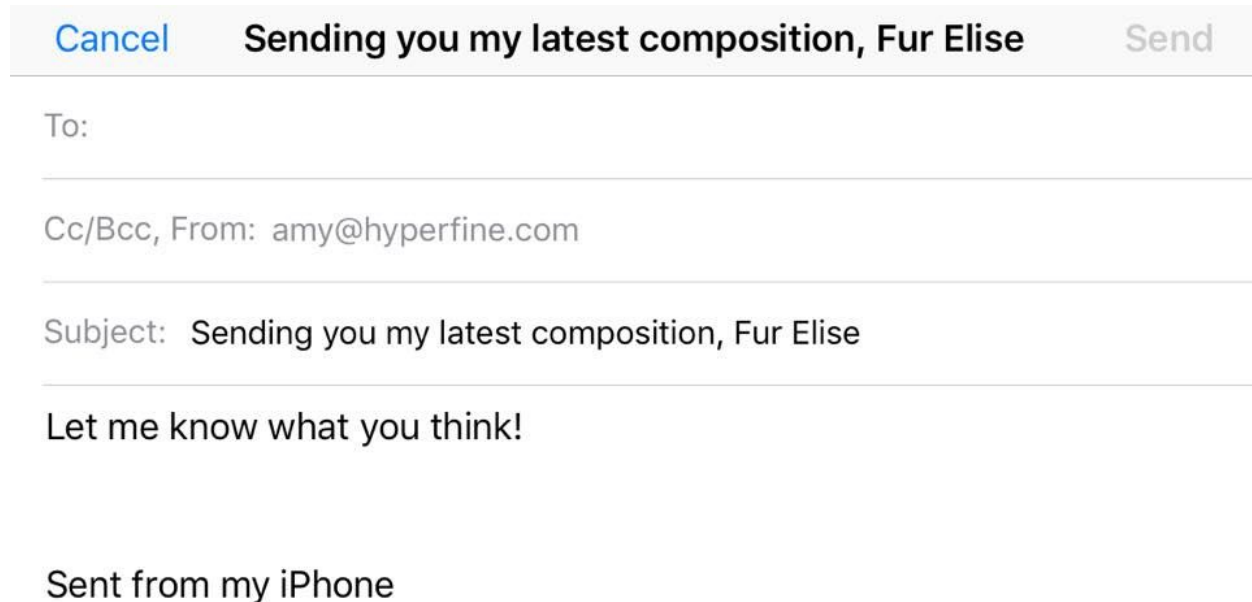
Once user hits “Transcribe,” they don’t have options of designating where the PDF goes or if they can access the composition again on the Allegro platform. Resolve by giving email/share options and exporting options, possibly to Sibelius or some other desktop composition software. Providing users the option to go back to past compositions on the home screen would also be very helpful.



2. **[H2-3 User Control and Freedom] [Severity 3] [Found by: A, B]**

The “Done” button on the confirmation screen for transcribing takes the user back to the home page, but users should have the option to go back to the composition screen.

This heuristic was resolved when we changed the “transcribe” task to the “share” task. Instead of “transcribing” and saving a pdf, users could simply share their pdf directly to email.



3. **[H2-10 Help and documentation] [Severity 3] [Found by: A, B, C]**

The app provides instructions for composition on the home screen, but the arrangement task does not offer a help or tutorial button so that users can troubleshoot or find instructions while first trying to arrange. It would be most helpful to access to documentation on the arrangement screen itself and not on the home screen to reduce the number of clicks.

Resolution: since we changed the arrange task, this heuristic was no longer relevant in our final prototype. The new edit / save compositions menu was intuitive and did not need further documentation.

4. **[H2-3 User Control and Freedom] [Severity 3] [Found by: A, B, C]**

The purpose of the “New” button on the arrangement screen is ambiguous; the user does not know what new thing they’re initiating by clicking this button, and it could be a point of frustration to be taken to a blank composition screen without any warning. This could be resolved by giving that button a more specific descriptor, adding a dialog asking

the user to confirm their action, and/or adding an additional “Back” button so that users can return to their work without arranging.

This heuristic became irrelevant when we changed the “arrange” task to edit / save new compositions.

5. **[H2-3 User Control and Freedom] [Severity 3] [Found By: A, B]**

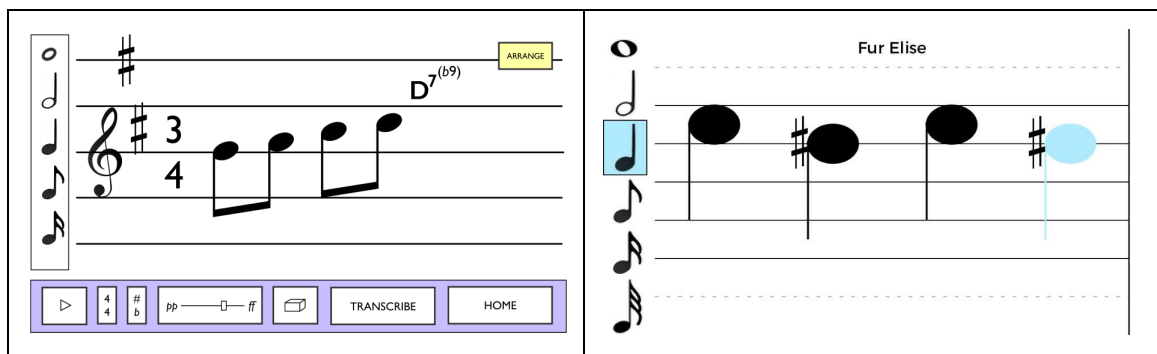
No back button on Chord input screen; resolve by adding a Cancel or Back button so users who accidentally add a chord can undo their action.

We removed the chord screen in the final prototype for simplicity and due to mixed results in user testing. It wasn't clear that chord entry was a core necessary feature for an app for simple note jotting. Chord entry may be a feature for future versions of the app.

6. **[H2-5 Error Prevention] [Severity 3] [found by A, B]**

Given the size of the hot zones for each note, users are susceptible to adding notes to the wrong place on the staff. For example, the zone that adds a note to a line extends quite far into the space below, so whether the note will add to the line or the space is pretty ambiguous. This might be helped by maximizing the space between staff lines or highlighting the space to which the note will be added, but this will be a tricky problem for someone who wants a fast and efficient way of inputting notes without worrying about checking their own errors.

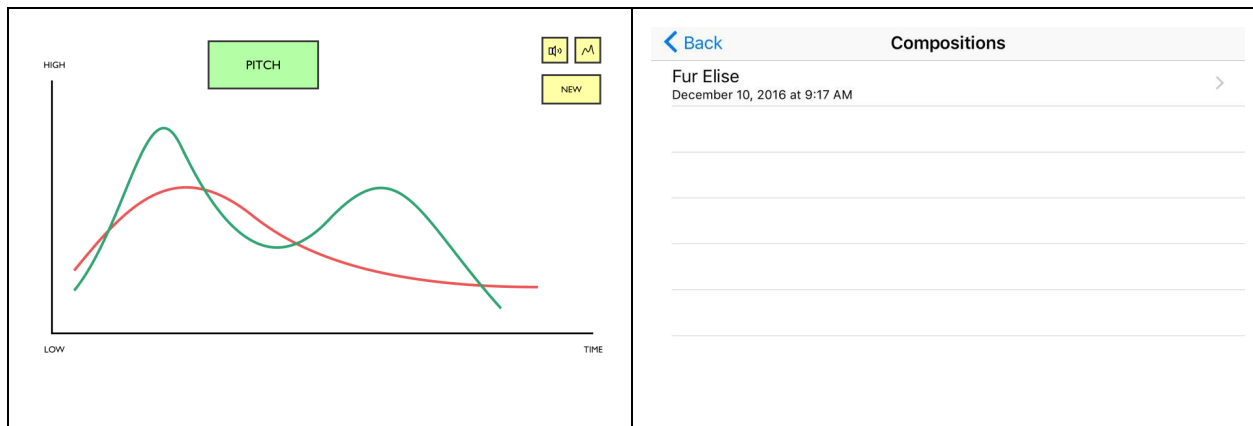
This was one of the biggest changes for the app as a whole - we increased the overall size of hot zones for notes by removing the bottom menu from the main composition screen and increasing the size of notes and staff lines. Overall this proved to be one of the most important fixes and biggest wins for the app - note entry became faster, more accurate, and more user friendly.



7. [H2-10: Help & Documentation] [Severity 4] [found by A,B,C]

I was very confused by the Arrange screen. I wasn't sure what the graph represented, as well as whether or not it was another tool that was contributing to my composition, a representation of my current composition, or a new composition entirely.

This was resolved by removing the old "arrange" functionality and replacing it with saving and editing existing compositions.



6. PROTOTYPE IMPLEMENTATION

Medium-Fi Prototype

Tools

We built our medium fi prototype using Figma and Marvel. Figma was very helpful in creating quick mock-ups of image designs and Marvel for designating hot spots in the prototype for users to interact with. Unfortunately, this also meant for our app in particular that users would not be able to input whatever notes they wanted since this would require an app to support all possibilities for user entry which would need to be programmed.

- ▣ Figma to create individual screens
 - ✓ Collaborative; easy to work together
 - ▣ Had to create many duplicate screens to show transitions
- ▣ Marvel to animate the demo
 - ✓ Made the app feel more real
 - ✓ Easy to use
 - ▣ Limited support for different gestures

- We couldn't implement certain iOS UI features, such as tickers and sliders

Improvements

For our medium-fi prototype, we made improvements like adding a home screen and instructions, improving flow between "new composition" and "arrange" and clicking "transcribe" resulted in a completion pop-up message.

We also removed the new measure button, new measures would be added automatically. The add key signature screen was also redesigned. Marvel made these improvements easy because we could replace screens in the storyboard very easily with new images.

Wizard of Oz Techniques / Hard Coded Data

- ▣ You can't really create a new composition; there are pre-set touch "hot spots"
- ▣ Time signature and key signature are pre-selected
- ▣ We couldn't animate "continuous" actions such as interacting with sliders and tickers
- ▣ Notes that users could enter were pre-selected

Hi-Fi Prototype

Tools

We built our high-fi prototype using iOS. The app was written in Swift. We also used Iconfinder and databases for musical notation to create our icons and some of our musical notation.

We wrote our own music rendering engine using iOS's graphics system. We based our class hierarchy for notes, chords, and compositions on MusicXML; however, we wrote all of our own classes. Finally, we wrote our own custom gesture recognizers for the music staff screen.

Wizard of Oz Techniques

While the "share" task does send an email to whoever the user specifies, it does not actually transcribe the composition to a PDF (we decided that this would require a lot of work and wouldn't actually show any human interaction insight).

Hard-coded Data

There is no hard-coded data.

Missing features for a potential v2:

- More complicated composition features

- Support for more complicated note durations which would require automatic barring
- Support for rests
- Support for chords (requires rendering multiple notes at the same position thoughtfully, right now they will render but not very attractively)
- Playback: user would be able to hear their composition played back to them
- Better gesture instructions that are interactive and overlaid on the new composition screen

7. SUMMARY

Overall, users were very happy with the results of our app. From a few iterations of user testing we were quickly able to narrow down our core feature set and iterate on that set to give the best possible final result. Throughout the process we also re-evaluated our initial needs to select only the most important ones for core features. In the end, quick and easy entry was first and foremost, followed by creating multiple compositions and sharing easily. The simplicity of the end design worked very much in our favor in terms of distinguishing our app from other composition apps which tend to be more complicated and feature heavy, but less user friendly and snappy.

8. APPENDICES

Byron Interview

3D physical gestures prototype

- Tried to zoom in but couldn't on sound wave
- Didn't know what to do with photo
- Thought play button was to swipe down
- Got into endless loop of actions
- How do i get back to original screen?
- Usually looking for a description of an app, so kind of biased
- "Take pictures of a scene, and associate sounds with it. Idea being that you can take more immersive photos." The composition aspect didn't come through. "Nice to have that." Another option besides a video.
- How do I associate a recording with a picture? Should be "do you want to keep this recording, yes or no?" Should save into bank of recordings.
- Took some time to find out to get back to original menu
- Would be nice if it prompted you for a recording when you take a photo. Like have the app built into the surrounding OS.
- 4 icons was really easy interface. Menu is nicely refined down to icons. "If I was a 10 year-old, I would understand it."
- discoverability in 1 direction - didn't think how users go back.
- functions seem to tie together - overlap.

Tactile gestures prototype

- "moving up to the note" - for the gesture REST
- seems to understand the gestural instruction fast and well.
- ambiguity with X and double # -> need to find universal instructions.
- automatic tie with notes (other apps) across bar lines
- instead of doing the 2 doubles pull, he just tap clef!
- Still cultural differences -> up/down or left/right.
- not sure how to make it play? Nice to have to have another bar of icons for functions.
- Playback is 8/9 on the scale of 10 -> play around with the notes - "put in random 16th notes and see what it sounds like"
- Would rather have as much screen real estate as possible – worried about fat fingers
- Gestures seem intuitive
- Chords: should be like Android password - "snapping." "Meh, seems cool." Logically it makes sense. Seems easy.
- He would prefer the chord menu, rather than drawing chords
- he tends to write on paper

- He hates having to fiddle with getting ONE note down — “hard to compete with paper.” Has to be as fast or faster than paper. He would sacrifice a bit of speed if it would go to MIDI. Prefers MIDI over PDF. Playback would also make it worth it.
- Natural note should just be to swipe to the right
- He remembered most of the gestures
- There are some menu navigation things to be considered, like having a play button
- iPhone 7: press hard
- Delete mode
- Copy and paste: duplicate whole phrases. Should have whole own mode. Better to not have annoying slip-ups.
- Discrete means of entering tempo and volume.

Non-conventional music visualizations

- Makes sense for social means of composing together — don’t see it anywhere else
- Having a mobile platform is perfect for being able to socially compose. Would be a plus for him — composing with friends. “Last summer, I was playing in a musical. I and another friend had to transcribe way too many songs that didn’t make it in. So we had to listen to so many songs and write them down. I ended up just having paper and writing it. This would be great, if I could listen to it, and transcribe it, and hand it over to my friend, and he could write the guitar part, after I wrote the piano and voice parts.” Collaborate.
- It’s important to be able to abstract out. Important to have varying levels of abstraction. He would personally find it useful. Combination is pretty crucial.

Alexander Ronneburg

- Intuitive interface
- Not sure what the “add measure” button does – called it the “slit” button
- Hopes he can click and drag notes (this wasn’t implemented ...)
- Not sure how to do rest - click the note once?
- Over bar line - the app doesn't have bar line?
- “Does it turn into a rest or a weird hole in the ...? (when he erased the note)
- Doesn't do multiple notes at the same time?
- Draw chord? Symbols? Roman numeral?
- Assume it is still on the original key signature.
- Assume he can erase what he drew (like the eraser) - “Draw the chord”
- Is there a note selected?
- What octave for the chord? Where does it go? What duration is it? Is it Jazz or classical notation in draw chord?
- Expected “swipe up” to do something
- Will it distinguish between an uppercase or lowercase letter in draw chord? wouldn't work for like “C”
- Wondered how “draw chord” would work for major/minor.
- The chord would draw in close position but is it what he want?

- Chord notation like b7/ ## doesn't work
- He liked the "choose chord" interface rather than the "draw chord" interface -- found the latter very confusing
- Wanted a chord inversion option on the chord interface
- grab notes didn't work.
- change color when he clicked.
- always piano? not sure why the screen exist? Click on the (gesture button) doesn't know what the gestural interface was? assume it was pitch - don't know why use pitch diagram
- don't know how to exit transcribe view
- confused when "tap to exit"
- why wouldn't it enter bar line automatically
- how do he type things? Accent? Slur? Legato?
- hold the note and articulation appear -> what he wants
- He wants single notes articulation
- Articulations: accent, tie (automatically to next note, unless it was a rest), staccato, legato. Accent and a staccato (multiple articulations at a time).
- Put the sharp, flat in the dialogue as well? if he can't figure it out.
- Doesn't have a clear preference between dialogue box and articulation mode. Maybe both?
- how to highlight multiple notes at the same time to do legato and slur. LAPTOP - control + click. Click and it has cursor. Want dialogue box.
- don't like to add his own bar line. But he want to change to repeat or double bar. The button is not helpful.
- Change key signature.
- Didn't get to pitch and volume screen. Never click exit? Expect a menu when he click exit, not a weird screen - save automatically. Changing to name - click on the text. Click on the screen thing. Why there's this pitch screen and there's also the other pitch screen. What does he do.
- volume screen . "hey that's cool." No use for pitch or volume screens if you can't edit it
- Doesn't appeal to him (the volume screen)
- how do he switch to different composition
- No Menu -> Can't do a lot of things
- Those volume and pitch screen are slightly helpful when he have multiple instruments.
- Like the play function that starts on the note of the app he uses
- Build the chord on his own not on the dialogue.

Joss Interview Notes

- Nice! When he sees the Key selection interface.
- Doesn't know what to do next ... when he first use the app.
- Try to erase the notes but can't -> Confused.
- Confused a lot with the gesture instruction

- Can't get anything done??????
- Seem to play with the eraser a lot?
- Still confused after a while
- Drew a score on draw note
- Barline button look confused
- Liked the automatic barline.
- Wants: crescendo, diminuendo, articulation.
- Erase (gesture) when he use eraser.
- What does transcribe mean? "When I hear transcribe, I imagine playing notes and having it transcribe them." Would change it to "Print PDF" or something.
- "How would I make a triplet?"
- Sibelius: fussy about how you put in triplets. You say "command 3" and it opens a dialogue. Often splits up triplets.
- Tried to draw eighth note rest exactly – on first glance. Most notes are one stroke (except for half notes and quarter notes).
- "cool that you have the modern composer in mind."
- When there is a defined meter, the bar lines should only make sense. If you try to drop a bar line where it shouldn't be, it shouldn't do anything, or otherwise fill in the rest of the measure with rests.
- Doesn't see why he would need a bar line button if there's a defined meter.
- Wants to be able to change the time signature for a score?
- If he change the time signature will the bar line shift?
- Undo button for last command.
- Clear all button (if the piece is really long, for example)
- Drew staff on draw chord
- Thought "draw chord" meant create chord
- want to duplicate note and chord. Repeat last thing.
- helpful to have bar line menu.
- put a note on top of another note -> what will it do? He want notes on top of each other - connect.
- Wants inversions on chord menu
- Wants to be able to drag notes into inversions
- Wants to be able to show ties to notate rhythm (for each individual note in the chord). Click and drag (a box) to highlight and then make the tie gesture.
- "Select all" to make multiple changes at once.
- Wants a slider for tempo. Wants in beats per minute not presto to andante. For playback purposes.
- Can't see how multiple parts line up
- Chuck (Ge Wang) - playback