

**COMP-8967: INTERNSHIP PROJECT I**

**PROFESSOR: DR. ZIAD KOBTI**

**PROJECT – AUDIO TO MIDI CONVERTER**

**TEAM 22**

**SUBMITTED ON 09 JUNE 2022**

**Ripudaman Singh Uppal || 110062380**

**Sumit Sureshkumar Patel || 110063045**

**Devanshu Rajeshkumar Mevada || 110069050**

**Surya Chandiramouli Subhashini || 110031875**

**Sagar Gupta || 110070771**

**Greeshma Veeravelli || 110059988**

**Divyangkumar Chodvadiya || 110059541**

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**Section I: Team Progress and Reporting**

* **Team Agendas and Meeting Minutes:**

**Minutes of Meeting COMP8967-1-R-2022S Internship Project 1 Team 22**

**30th May 2022, 3:30 PM EDT**

The meeting was conducted on MS Teams and each team member was present.

The agenda of the meeting was to discuss and brainstorm ideas on the audio-to-midi technology, which will be the main focus of the project. The details of the meeting are as below:

* Discussed the core features of various audio formats.
* Compared conversion process with other conversion methodologies.
* The differences between different front-end frameworks were discussed.

**Attendees:**

**Ripudaman Singh Uppal || 110062380**

**Sumit Sureshkumar Patel || 110063045**

**Devanshu Rajeshkumar Mevada || 110069050**

**Surya Chandiramouli Subhashini || 110031875**

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**Minutes of Meeting COMP8967-1-R-2022S Internship Project 1 Team 22**

**2nd June 2022, 12:00 PM EDT**

The meeting was conducted on MS Teams and each team member was present.

The agenda of the meeting was to have a discussion and assign tasks among all the members to complete the project on time. The details of the meeting are as below:

* Discussed the initial findings on conversion methodologies.
* Divided the tasks among all the team members.

The team agreed to complete the project by 07th June 2022.

**Attendees:**

**Ripudaman Singh Uppal || 110062380**

**Sumit Sureshkumar Patel || 110063045**

**Devanshu Rajeshkumar Mevada || 110069050**

**Surya Chandiramouli Subhashini || 110031875**

**Sagar Gupta || 110070771**

**Greeshma Veeravelli || 110059988**

**Divyangkumar Chodvadiya || 110059541**

**Minutes of Meeting COMP8967-1-R-2022S Internship Project 1 Team 22**

**6th June 2022, 11 AM EST**

The meeting was conducted on MS Teams and each team member was present.

The agenda of the meeting was to have a discussion and assign tasks among all the members to complete the documentation and look at the feedback for the initial project version. The details of the meeting are as below:

* Discussed the feedback given by team members.
* Divided the tasks for the next step of documentation.
* The structure that we decided to follow for documentation:
* Abstract
* Applications
* Challenges
* Scope

**Attendees:**

**Ripudaman Singh Uppal || 110062380**

**Sumit Sureshkumar Patel || 110063045**

**Devanshu Rajeshkumar Mevada || 110069050**

**Surya Chandiramouli Subhashini || 110031875**

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**Greeshma Veeravelli || 110059988**

**Divyangkumar Chodvadiya || 110059541**

**Section II: Team Agreement**

**Commitments:**

1. Completing tasks before project deadlines.
2. Difficulties being experienced by team members to be discussed as soon as possible.
3. Update on assigned tasks to be provided on MS Teams.
4. Any changes concerning the project or team member availability to be notified in advance.
5. Sufficient time commitment to be provided by each team member.

**Team Meeting ground rules:**

1. All members should be present throughout the meeting.
2. Each member should take part in brainstorming sessions.
3. Opinions should be openly voiced, and healthy discussions should take place.
4. Professional etiquette and ethical practices should be followed.

**Meeting Procedures:**

1. Meetings will be held based on work needs and scheduled well in advance.
2. Accountability and responsibility to be given to each member.
3. The minutes of the meeting will be posted in the MS Teams group conversation.

**Section III: Project Documentation**

**Abstract**

In the project, we have used HTML and CSS for the front-end. HTML web page will take input from the client, the client can either upload an audio file with solo piano from their device.

For the back-end side, we have used Javascript. Javascript code converts audio files to MIDI files using Onsets and Frames, a neural network trained for a polyphonic piano transcription.

**Applications**

MIDI is almost always an integral part of the modern recording process for popular music so this converter can be helpful for the film and TV industry as well as for the video games developer.

More and more, DJ artists can also use this converter, through the converter they can create MIDI files and manipulate sound, trigger beats and loops, and control lighting.

**Development Stack**

The following tools and technologies have been used in the project:

* HTML
* CSS
* JavaScript
* Tensorflow and Magenta.js
* Replit (for deployment)

**Challenges**

Many challenges were faced during the development of this project, major ones of which have been mentioned described below:

1. *Team Meeting Schedules*

With every team member on a different schedule, it was a difficult task to be able to find sync in the development process for the project and the tasks that were required to be fulfilled. Discussions were important to be held every day to discuss progress as well as hurdles faced and to be able to further plan based on the overall progress made and optimize.

To overcome this challenge, the team decided to set up a particular each day for the team meeting which would be suitable for every team member. Team meetings on MS Teams were held each day at that time to discuss and plan the development of the project. Each team member was required to attend the daily meeting.

1. *Choosing the right development stack*

The team researched the right tools and development stack needed for the project and initially planned to use Python for the achievement of the conversion task. Having gone with that decision, a lot of conversion libraries as well as ML models were researched and were queued for integration with the system. A lot of problems were faced with the Python environment set up as a lot of libraries as well as models were architecturally either not supported with the system or had some unknown dependency which required to be resolved to create more problems as the integration moved further.

To overcome this challenge, JavaScript was decided to be used and further research was done to be decided upon the tools that were to be used. Upon researching, Tensorflow and Magenta.js were used to develop the conversion module.

1. *Link conversion problem*

Currently, Links conversion is not working. Upon investigating further, it was because of the cors error that originated from the source. Links are protected originally.

**Scope**

As for the scope of the project built, it boils down to the integration needed for the specific purpose. This system can be scoped as an accessory to other applications that might want to offer similar functionalities. Furthermore, more and more conversion formats can be added that might expand the overall domain of the formats that might be supported for the conversion.

The final deployed version of the project can be accessed [here](https://wavtomidi.sagargupta16.repl.co/).

**User Manual**

**URL of the Project: https://wavtomidi.sagargupta16.repl.co/**

This guide will teach you how you can use this website and take benefit from its features.

Home Screen:

We provide two features to convert a wav file into a midi file.

1. By giving the URL of a wav file as an input
2. By directly uploading a wav file from the Local Computer
3. **By giving the URL of  a wav file as an input:**

* Paste the URL of a wav file in the below-mentioned field.

A screenshot of a computer

Description automatically generated

* After pasting a URL, press the convert button shown in the following image to convert a wav file into a midi file

A screenshot of a computer

Description automatically generated

1. **By directly uploading a wav file from the Local Computer:**

* Click on the upload button as shown in the below image to upload a wav file from the local computer.

A screenshot of a computer

Description automatically generated

* Select a wav file from your local computer

A screenshot of a computer

Description automatically generated

* Press the Open button to upload a selected wav file.

A screenshot of a computer

Description automatically generated

* Now it starts converting from a wav file to a midi file.

A screenshot of a computer

Description automatically generated

**Result**

The project was completed on time meeting all the deadlines and the following objectives were achieved:

* Audio-to-midi converter was developed with a fully functioning UI.
* The project was built using Agile Methodologies resulting in an increased understanding of the agile mindset.
* The concepts of team collaboration were understood.

**References**

“Magenta.js,” *Magenta*, 02-May-2018. [Online]. Available: https://magenta.tensorflow.org/js-announce

“Tensorflow,” *TensorFlow*. [Online]. Available: https://www.tensorflow.org/.

Source Code referred: https://glitch.com/edit/#!/piano-scribe?path=index.html%3A1%3A0