

# Project Report On Audio Extrapolation

Submitted in partial fulfilment of the requirements for the award of the degree of

### BACHELOR OF TECHONOLOGY IN

#### COMPUTER SCIENCE AND ENGINEERING

Submitted by

Amandeep Ashwani Bhat

Enroll. No. CSE/512/14 Enroll. No. CSE/514/14

Under the supervision of

Mrs. Shaima Qureshi Ms. Azra Nazir

Department of Computer Science

National Institute of Technology, Srinagar

J&k June 2018

## Department of Computer Science and Engineering National Institute of Technology Srinagar



#### **CERTIFICATE**

This is to certify that the project titled "AUDIO EXTRAPOLATION" has been completed by Amandeep (CSE/512/14) and Ashwani Bhat (CSE/514/14) in partial fulfilment of the requirements for the award of the degree of Bachelor of Technology in Computer Science.

Miss Azra Nazir

Mrs Shaima Qureshi

NIT Srinagar

**Assistant Professor** 

Department of Computer Science and Engineering

NIT Srinagar

Dr. Roohie Naaz Mir

Head

Department of Computer Science and Engineering

NIT Srinagar

## Department of Computer Science and Engineering National Institute of Technology, Srinagar



#### **STUDENT'S DECLARATION**

We, hereby declare that the work, which is being presented in the project entitled **AUDIO EXTRAPOLATION** in partial fulfilment of the requirements for the award of the degree of **Bachelor of Technology** in **Computer Science** in the session 2018, is an authentic record of our own work carried out under the supervision of **Mrs. Shaima Qureshi** and **Ms. Azra Nazir**, Department of Computer Science, National Institute of Technology, Srinagar.

Dated: 11<sup>th</sup>June 2018

i) Name	Amandeep	
Signature		
ii) Name	Ashwani Bhat	
Signature		

#### **ACKNOWLEDGEMENT**

We would like to express our heartfelt gratitude to our project guide, Mrs.Shaima Qureshi and co-guide, Ms. Azra Nazir for their valuable suggestions and guidance in the preparation of this project.

Also it is our duty to highly acknowledge with grateful thanks to all the authors of the references and other literatures referred to in this project.

Finally, we thank our parents and friends for their valuable support.

#### **ABSTRACT**

Various techniques of machine learning for audio extrapolation are analyzed in this project. Audio dataset is not considered as a simple dataset as its dimensionality is very high. Hence, manipulation of audio dataset is also being considered in this project. Various machine learning regression models are being studied based upon their extent of efficiency of generating unknown audio samples. Also some applications of audio extrapolation are being described. The extrapolation is applied in practice to eliminate impulsive noise bursts and to recover the missing signal samples.

#### TABLE OF CONTENTS

4.4.2 K Neighbor Regression
4.4.3 Decision tree Regression
4.4.4 Random Forest Regression
4.4.5 Support Vector Regression
4.2 Audio Visualization
4.2.1 using Matplotlib16
4.2.2 using Seaborn
Chapter 5: Implementation
5.1 Workflow
5.2 Dataset
5.3 Data preparation
5.4 Forming train and test splits
Chapter 6: Results
6.1 With 20% input
6.1.1 Linear Regression
6.1.2 K Neighbor Regression
6.1.3 Decision Tree Regression
6.1.4 Random Forest Regression23
6.1.5 Support Vector Regression24
6.2 With 50% input
6.2.1 Linear Regression
6.2.2 K Neighbor Regression
6.2.3 Decision Tree Regression
6.2.4 Random Forest Regression

6.2.5 Support Vector Regression	29
Chapter 7: Conclusions and Future Work	
7.1 Conclusions	30
7.2 Future Work	32
References	33

#### LIST OF FIGURES

1.1	Interpolation vs Extrapolation01	
2.1	Flow Chart of concealment mechanism of AoIP software	
3.1	Anaconda Distribution	
4.1.1	Linear Regression Example09	
4.2.1	Visualization using matplotlib	
4.2.2	Visualization using Seaborn	
5.1	Workflow	
6.1.1.1	Linear Regression with 20% input(scatterplot)20	
6.1.1.2	Linear Regression with 20% input(heartbeatplot)20	
6.1.2.1	K Neighbor Regression with 20% input(scatterplot)21	
6.1.2.2	K Neighbor Regression with 20% input(heartbeatplot)21	
6.1.3.1	Decision Tree Regression with 20% input(scatterplot)22	
6.1.3.2	Decision Regression with 20% input(heartbeatplot)	
6.1.4.1	Random Forest Regression with 20% input(scatterplot)23	
6.1.4.2	Random Forest Regression with 20% input(heartbeatplot)23	
6.1.5.1	Support Vector Regression with 20% input(scatterplot)24	
6.1.5.2	Support Vector Regression with 20% input(heartbeatplot)	
6.1.1.1	Linear Regression with 50% input(scatterplot)25	5
6.2.1.2	Linear Regression with 50% input(heartbeatplot)25	5
6.2.2.1	K Neighbor Regression with 50% input(scatterplot)	6
6.2.2.2	K Neighbor Regression with 50% input(heartbeatplot)	6
6.2.3.1	Decision Tree Regression with 50% input(scatterplot)	7
6.2.3.2	Decision Regression with 50% input(heartbeatplot)	7

6.2.4.1	Random Forest Regression with 50% input(scatterplot)	28
6.2.4.2	Random Forest Regression with 50% input(heartbeatplot)	28
6.2.5.1	Support Vector Regression with 50% input(scatterplot)	29
6.2.5.2	Support Vector Regression with 50% input(heartbeatplot)	29
7.1.1	Overall comparison of models with 20% input	30
7.1.2	Overall comparison of models with 50% input	31