

# Table of Content

<b>1. Introduction</b>	<b>1</b>
1.1. Problem Statement . . . . .	2
1.2. Hypothesis . . . . .	3
1.3. Objectives . . . . .	3
1.3.1. General Objective . . . . .	3
1.3.2. Specific Objectives . . . . .	3
1.4. Methodology . . . . .	3
1.5. Thesis Structure . . . . .	4
<b>2. Background and Related Work</b>	<b>5</b>
2.1. Scientific Disciplines . . . . .	5
2.1.1. Artificial Intelligence . . . . .	5
2.1.2. Machine Learning . . . . .	6
2.1.3. Automated Music Generation . . . . .	10
2.2. Music Generation . . . . .	12
2.2.1. Preliminary Concepts . . . . .	12
2.2.2. Data Representation . . . . .	12
2.2.3. Vector Encoding . . . . .	15
2.3. Music Inpainting Task . . . . .	18
2.4. Related Work . . . . .	18
2.4.1. Similar Benchmarks . . . . .	18

2.4.2. Music Inpainting Models . . . . .	18
2.4.3. Metrics . . . . .	21
<b>3. MUSIB: Music Inpainting Benchmark</b>	<b>24</b>
3.1. Motivation . . . . .	24
3.2. Datasets . . . . .	25
3.3. Evaluation . . . . .	27
3.3.1. Note Metrics . . . . .	27
3.3.2. Divergence Metrics . . . . .	31
3.4. Results and Discussion . . . . .	35
<b>4. MUSIB Implementation Details</b>	<b>38</b>
4.1. Data Processing . . . . .	38
4.1.1. Download from source . . . . .	38
4.1.2. Make data frames . . . . .	40
4.1.3. Clean data . . . . .	41
4.2. Feature Extraction . . . . .	41
4.2.1. Encoding MIDI as vectors . . . . .	42
4.2.2. MIDI Dataset . . . . .	43
4.3. Model Architecture and Training . . . . .	44
4.4. Evaluation . . . . .	44
<b>5. Conclusions and Future Work</b>	<b>45</b>
5.1. Conclusions . . . . .	45
5.1.1. Main Findings . . . . .	46
5.1.2. Future Work . . . . .	47
<b>Bibliography</b>	<b>53</b>