# Description of Work

Détection et classification de sons à l'aide de Spiking Neural Networks

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### 1 Introduction - General objective

- 1.1 An intro to NNS (how it works fast)
- 1.2 Why NNS for our project
- 1.3 The chosen problem
- 1.4 The reasons for our choice
- 1.5 Why audio set
- 1.6 Exploratory approach we start from nothing, then explain

#### 2 Data used

- 2.1 Choosing the type of training data
- 2.2 Feasibility (audio ¿ image simpler)
- 2.3 Choose database
- 2.3.1 Copyright
- 2.3.2 Time for pre-processing, cleaning ...
- 2.3.3 Uncertainties about data quality, ...
- 2.4 Open to other databases

#### 3 Chosen theme

- 3.1 The NSS
- 3.1.1 Definition
- 3.1.2 How it works
- 3.1.3 Advantages / Disadvantages
- 3.1.4 SNN torch
- 3.2 SNNs applied to audio classification
- 3.2.1 Definition
- 3.2.2 How it works
- 3.2.3 Advantages / Disadvantages
- 3.3 Relevance of this choice
- 3.3.1 Defining the project's pros and cons
- 3.3.2 Cases of use to define the relevance of the project

#### 4 State of the art

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- 4.1 Finding what already exists
- 4.1.1 In a simple neural network

Trained on the same data set or not

#### 4.1.2 In SNN

Trained on the same data set or not

- 4.1.3 Existing libraries, existing models
- 4.2 Results obtained as a basis for comparison
- 5 Technical objectives of the project
- 5.1 Technical objectives achievable with pre-existing ANNs
- 5.2 Technical objectives with data
- 5.3 Technical objectives with SNNs
- 5.4 Feasibility
- 5.4.1 Describing uncertainties
- 5.4.2 Looking for a working model
- 5.4.3 Estimate computation time
- 6 Theoretical study
- 6.1 Theoretical study on SNN
- 6.2 Investigative approach
- 7 Matching with available resources
- 7.1 Work time
- 7.2 Computer resources
- 7.3 Human resources