

RAFAEL VALLE

MACHINE LEARNING DATA ANALYSIS MUSIC INFORMATION RETRIEVAL

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Profile

6+ years of experience developing high performance machine learning algorithms for data/audio analysis and machine improvisation with formal specifications.

PROFESSIONAL EXPERIENCE

SENIOR RESEARCH SCIENTIST @ NVIDIA

2017 SEP -

Develop models for audio and computer vision

– Neural Networks DSP

RESEARCH INTERN @ GRACENOTE

Develop models for style classification and algorithms for music structure segmentation

– Neural Networks Bayesian Hyperparameter Optimization DSP

SCIENTIST INTERN @ PANDORA

2016 JUN-AUG

Investigate segments and scores that describe novelty seeking behavior in Pandora listeners

– Random Forest GLM

VISITING RESEARCHER @ LABROSA AT COLUMBIA UNIVERSITY

2015 JUL-SEP

Develop algorithms for beat extraction, local key estimation and chord transcription

– MIR HMM

DATA SCIENTIST @ PERCOLATA

2014-2015 NOV-JAN

Occupancy prediction from sensor fusion occupancy estimates

– Time series analysis EDA ARIMA STL

AUDIO ANALYST & DATA SCIENTIST @ BAY SENSORS

2014 MAY-AUG

Design a machine listening engine to estimate room occupancy and activity from audio

Increase estimation accuracy by designing a sensor fusion (audio, video, wifi) algorithm

– GLM GMM HMM Python Sklearn Stats-models Matplotlib

CURRENT PROJECTS

PHD RESEARCH

Implementation of a framework for music specification mining in the symbolic and audio domains

Development of generative adversarial models for machine listening and improvisation

Audio segmentation and visualization

– RNN GAN Stochastic Variational Inference Hierarchical Dirichlet Processes

TERRASWARM RESEARCH CENTER

Privacy Aware Keyword Spotting

Design and implement formal specifications for control improvisation systems

Provide Music Information Retrieval resources and frameworks

– Neural Networks HMMs Factor Oracles Formal Methods

EDUCATION

UC Berkeley — GPA 3.96 Interdisciplinary PhD in Machine Listening and Improvisation, 2018

MH-Stuttgart, Germany — Master in Computer Music, 2011

ECU, USA — Master in Computer Music, 2010

UFRJ, Brazil — Bachelor in Orchestral Conducting, 2009

PUBLICATIONS

Flowtron: an Autoregressive Flow-based Generative Network for Text-to-Speech Synthesis RAFAEL VALLE , KEVIN SHIH, RYAN PRENGER, BRYAN CATANZARO	arXiv 2020
Mellotron: Multispeaker Expressive Voice Synthesis by Conditioning on Rhythm, Pitch and Global Style Tokens RAFAEL VALLE , JASON LI, RYAN PRENGER, BRYAN CATANZARO	ICASSP 2020
Waveglow: A Flow-based Generative Network for Speech Synthesis RYAN PRENGER, RAFAEL VALLE , BRYAN CATANZARO	ICASSP 2019
Hands-On Generative Adversarial Networks with Keras (book) RAFAEL VALLE	Packt 2019
Attacking Speaker Recognition with Generative Models Anish Doshi, Wilson Cai, RAFAEL VALLE	arXiv 2018
Intriguing properties of GAN samples RAFAEL VALLE , Wilson Cai, Anish Doshi	arXiv 2017
Attention Networks for image-to-text Jason Poulos and RAFAEL VALLE	arXiv 2017
ABROA : Audio-Based Room-Occupancy Analysis using Gaussian Mixtures and Hidden Markov Models RAFAEL VALLE	FTC'16 DCASE'16
Learning and Visualizing Music Specifications Using Pattern Graphs RAFAEL VALLE , Alexandre Donz�, Daniel Fremont, Ilge Akkaya, Sanjit Seshia, Adrian Freed	ISMIR'16
Missing Data Imputation for Supervised Classification Jason Poulos and RAFAEL VALLE	AAI'18
Specification Mining for Machine Improvisation with Formal Specification RAFAEL VALLE , Alexandre Donz�, Daniel Fremont, Ilge Akkaya, Sanjit Keshia, Adrian Freed	CIE'16
Control Improvisation with Probabilistic Temporal Specifications Ilge Akkaya, Daniel Fremont, RAFAEL VALLE , Edward Lee, Sanjit Seshia	IoTDI'15
NP-MUS : Symbolic Music Similarity using Neuronal Periodicity and Dynamic Programming RAFAEL VALLE	MCM'15
Machine Improvisation with Formal Specifications Alexandre Donz�, RAFAEL VALLE , Ilge Akkaya, Sophie Libkind, Sanjit Seshia, David Wessel	ICMC'15
Gradual Control of Harmonicity in the context of Frequency Modulation RAFAEL VALLE	ICMC'14
Towards a Dynamic, Inclusive and Equalitarian Augmented Activity Space RAFAEL VALLE	ICMC'14

SKILLS

DEEP LEARNING

Normalizing Flows, GAN, CNN, RNN, Seq2Seq, Feedforward, Bayesian Hyperparameter Optimization

MACHINE LEARNING

Classification, Clustering, Regression, Dimensionality reduction, Data visualization, Feature selection, etc

LIBRARIES

PyTorch, Theano, TensorFlow, Lasagne, Scikit-Learn, Statsmodels, Pandas, Matplotlib

PROGRAMMING AND SCRIPTING LANGUAGES

Python, R, Matlab, Java, C, Lua, SQL, Hadoop Hive