Rafael Valle

MACHINE LEARNING DATA ANALYSIS MUSIC INFORMATION RETRIEVAL
rafaelvalle@berkeley.edu 510 847 3852 rafaelvalle.github.io

Profile

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

Professional Experience

SENIOR ESEARCH 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

Mellotron: Multispeaker Expressive Voice Synthesis by Conditioning on Rhythm, Pitch and Global Style Tokens — ICASSP 2020
Rafael Valle, Jason Li, Ryan Prenger, Bryan Catanzaro,

Waveglow: A Flow-based Generative Network for Speech Synthesis — ICASSP 2019
Ryan Prenger, Rafael Valle, Bryan Catanzaro

Hands-On Generative Adversarial Networks with Keras (book) — Packt 2019
Rafael Valle

Attacking Speaker Recognition with Generative Models — arXiv 2018
Anish Doshi, Wilson Cai, Rafael Valle

Intriguing properties of GAN samples — arXiv 2017
Rafael Valle, Wilson Cai, Anish Doshi

Attention Networks for image-to-text — arXiv 2017
Jason Poulos and Rafael Valle

ABROA : Audio-Based Room-Occupancy Analysis using Gaussian Mixtures and Hidden Markov Models — FTC'16 DCASE'16
Rafael Valle

Learning and Visualizing Music Specifications Using Pattern Graphs — ISMIR'16
Rafael Valle, Alexandre Donzé, Daniel Fremont, Ilge Akkaya, Sanjit Seshia, Adrian Freed

Missing Data Imputation for Supervised Classification — AAI'18
Jason Poulos and Rafael Valle

Specification Mining for Machine Improvisation with Formal Specification — CIE'16
Rafael Valle, Alexandre Donzé, Daniel Fremont, Ilke Akkaya, Sanjit Keshia, Adrian Freed

Control Improvisation with Probabilistic Temporal Specifications — IoTDI'15
Ilge Akkaya, Daniel Fremont, Rafael Valle, Edward Lee, Sanjit Seshia

NP-MUS : Symbolic Music Similarity using Neuronal Periodicity and Dynamic Programming — MCM'15
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Machine Improvisation with Formal Specifications — ICMC'15
Alexandre Donzé, Rafael Valle, Ilge Akkaya, Sophie Libkind, Sanjit Seshia, David Wessel

Gradual Control of Harmonicity in the context of Frequency Modulation — ICMC'14
Rafael Valle

Towards a Dynamic, Inclusive and Equalitarian Augmented Activity Space — ICMC'14
Rafael Valle

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