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 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

Waveglow: A Flow-based Generative Network for Speech Synthesis
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 Donzé, 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 Donzé, Daniel Fremont, Ilke 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 Donzé, 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