

# RAFAEL VALLE

ARTIFICIAL INTELLIGENCE   DEEP LEARNING   MACHINE LEARNING  
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Polymath with 6+ years of research and development experience in audio and computer vision. My research expertise revolves around artificial intelligence, deep learning and machine learning. I am passionate about generative modeling, machine perception and machine improvisation. Normalizing Flows >>> VAEs >>> GANs

## PROFESSIONAL EXPERIENCE

- SENIOR RESEARCH SCIENTIST** @ NVIDIA 2017 SEP -  
Develop models for expressive speech synthesis, audio denoising and image segmentation
- RESEARCH INTERN** @ GRACENOTE 2016 SEP -DEC  
Develop models for style classification and music structure segmentation
- SCIENTIST INTERN** @ PANDORA 2016 JUN-AUG  
Investigate segments and scores that describe novelty seeking behavior in Pandora listeners
- VISITING RESEARCHER** @ LABROSA AT COLUMBIA UNIVERSITY 2015 JUL-SEP  
Develop algorithms for beat extraction, local key estimation and chord transcription
- DATA SCIENTIST** @ PERCOLATA 2014-2015 NOV-JAN  
Improve occupancy prediction from sensor fusion occupancy estimates
- 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

## 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

### TERRASWARM RESEARCH CENTER

Privacy Aware Keyword Spotting  
Design and implement formal specifications for control improvisation systems  
Provide Music Information Retrieval resources and frameworks

## 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

<b>Improving Keyword Spotting with Synthetic Speech</b> U. VAIDYA, <a href="#">RAFAEL VALLE</a> , M. JAIN, U. AHMED, V. KARANDIKAR, S. S. CHAUHAN, BRYAN CATANZARO	Under review
<b>Flowtron: an Autoregressive Flow-based Generative Network for Text-to-Speech Synthesis</b> <a href="#">RAFAEL VALLE</a> , KEVIN SHIH, RYAN PRENGER, BRYAN CATANZARO	Under review
<b>Neural ODEs for Image Segmentation with Level Sets</b> <a href="#">RAFAEL VALLE</a> , FITSUM REDA, MOHAMMAD SHOEBI, PATRICK LEGRESLEY, ANDREW TAO, BRYAN CATANZARO	arXiv 2019
<b>Mellotron: Multispeaker Expressive Voice Synthesis by Conditioning on Rhythm, Pitch and Global Style Tokens</b> <a href="#">RAFAEL VALLE</a> , JASON LI, RYAN PRENGER, BRYAN CATANZARO	ICASSP 2020
<b>WaveGlow: A Flow-based Generative Network for Speech Synthesis</b> RYAN PRENGER, <a href="#">RAFAEL VALLE</a> , BRYAN CATANZARO	ICASSP 2019
<b>Hands-On Generative Adversarial Networks with Keras (book)</b> <a href="#">RAFAEL VALLE</a>	Packt 2019
<b>Missing Data Imputation for Supervised Classification</b> Jason Poulos and <a href="#">RAFAEL VALLE</a>	AAI'18
<b>Attacking Speaker Recognition with Generative Models</b> Anish Doshi, Wilson Cai, <a href="#">RAFAEL VALLE</a>	arXiv 2018
<b>TequilaGAN: How to easily identify GAN samples</b> <a href="#">RAFAEL VALLE</a> , Wilson Cai, Anish Doshi	arXiv 2017
<b>Attention Networks for image-to-text</b> Jason Poulos and <a href="#">RAFAEL VALLE</a>	arXiv 2017
<b>ABROA : Audio-Based Room-Occupancy Analysis using Gaussian Mixtures and Hidden Markov Models</b> <a href="#">RAFAEL VALLE</a>	FTC'16 DCASE'16
<b>Learning and Visualizing Music Specifications Using Pattern Graphs</b> <a href="#">RAFAEL VALLE</a> , Alexandre Donz�, Daniel Fremont, Ilge Akkaya, Sanjit Seshia, Adrian Freed	ISMIR'16
<b>Specification Mining for Machine Improvisation with Formal Specification</b> <a href="#">RAFAEL VALLE</a> , Alexandre Donz�, Daniel Fremont, Ilge Akkaya, Sanjit Keshia, Adrian Freed	CIE'16
<b>Control Improvisation with Probabilistic Temporal Specifications</b> Ilge Akkaya, Daniel Fremont, <a href="#">RAFAEL VALLE</a> , Edward Lee, Sanjit Seshia	IoTDI'15
<b>NP-MUS : Symbolic Music Similarity using Neuronal Periodicity and Dynamic Programming</b> <a href="#">RAFAEL VALLE</a>	MCM'15
<b>Machine Improvisation with Formal Specifications</b> Alexandre Donz�, <a href="#">RAFAEL VALLE</a> , Ilge Akkaya, Sophie Libkind, Sanjit Seshia, David Wessel	ICMC'15
<b>Gradual Control of Harmonicity in the context of Frequency Modulation</b> <a href="#">RAFAEL VALLE</a>	ICMC'14

## SKILLS

### DEEP LEARNING

Normalizing Flows, Neural ODEs, GANs, VAEs, etc

### MACHINE LEARNING

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

### LIBRARIES

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

### PROGRAMMING AND SCRIPTING LANGUAGES

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