

# Hörmet Yiltiz

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## Skills and accomplishments

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**Domain knowledge:** Machine learning, deep learning, image/signal processing, Bayesian modeling, MCMC, neuroscience, statistics, multivariable calculus, linear systems, optimization, visualization, information theory.

**Development:** High performance computing, library design, unit tests, virtualization, networking, database management.

**Languages:** Python, MATLAB, R, Haskell, C, Shell, JavaScript, HTML/CSS, SQL, Go.

**Tools:** Pytorch, scikit-learn, Numpy, pandas, libsvm, OpenGL; Linux, macOS, Nginx, Git, slurm, AWS.

**Publications:** 4 papers in peer-reviewed academic journals; presented 6 posters at international conferences.

## Education

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**Ph.D., *New York University*, Cognition & Perception (with Quantitative Minor)** NEW YORK  
Key courses: Deep Learning (by Yann LeCun), Foundations of Machine Learning, Machine Learning, Psychophysics, Perception, Data Simulation & Analysis, Bayesian Modeling of Behavior, Neuroeconomics & Decision-Making. 2020 (expected)

**B.S., *Peking University*, Experimental Psychology** BEIJING  
Key courses: Data Structures & Algorithms, Linear Algebra, User Experience Seminar, Industrial-organizational Psychology. 2014

## Professional experience

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**Researcher and project leader, *NYU*, Modeling adaptation in human vision.** NEW YORK  
Built bio-plausible neural networks and experimentally confirmed model predictions. Designed an algorithm used to calibrate a 10 bit-per-channel display for high-precision image presentation. Built an ideal observer model using image processing. 2016–2020

**Researcher and project leader, *NYU*, A clinical test for crowding.** NEW YORK  
Innovated a highly precise method to measure crowding, which allowed measuring central crowding for the first time. 2015–2016

**Research Assistant, *Institute of Acoustics, Chinese Academy of Sciences*, Building Auditory Localization Lab.** BEIJING  
Proposed psychophysical constraints to the engineers. Selected hardware. Co-designed a 3D sound localization lab. 2013–2015

**Sysadmin, project manager and fund raiser, NeuroDebian Project, neuro.debian.org.** MULTINATIONAL  
Got funding and support from 6 academic organizations and 2 communities and brought NeuroDebian into China, doubling the supporters/sponsors of the project in 3 months. 2015–

**Selected projects** ..... [available on Github at hyiltiz/<project-name>](#).

**Adaboost.Sampled:** Invented an ensemble method algorithm with ten times faster convergence than AdaBoost. Implemented from the scratch in Python and tested in predicting breast cancer and diabetes. Proved generalization error bounds.

**canonNet:** Implemented a library for a novel context-dependent online-learning algorithm to model normalization — one of the canonical computations of the brain. Tested with psychophysics experiments.

**nps:** Designed a domain-specific language that aids non-programmers in describing various sampling procedures. Can be used with a spreadsheet to automate stochastic tasks.

**MVC-Psych:** Built a Model-View-Control inspired framework for scientists to streamline experiment design, data collection, and analysis. Highly configurable due to the modular design; easy to unit test due to the functional programming style.

**bocd:** Built a Bayesian Online Change Detection model for online probabilistic inference of hidden state changes. Designed a reinforcement learning experiment for mice in collaboration and modeled their beliefs about the future.

**NoiseDiscrimination:** Implemented efficient dynamic noise and contributed bug fixes and cross-platform compatibility patches. Studied the space-time dynamics of object recognition. Compared humans to algorithmic ideal observers.

**PLW:** Built a toolbox for motion research supporting images, sounds and touch stimuli, and 3D dynamic visualization.

**wormy:** Invented a shuffle/arrangement game and implemented along with its solver for console in Python.

**vim-plugins-profile:** To optimize workflow, implemented a profiler for Vim's plugins that visualize startup time statistics. Runs in all major platforms. Supports Python, R, Ruby, Bash or Awk. (Received around 500 stars in Github.)