# Sandeep Jain

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## SUMMARY

**Creative computer scientist** with degrees in **Physics, Engineering and Applied Science**, and **Computer Science** from **top American universities**. Experience and expertise in **Machine Learning/Neural Networks,** specifically using numpy and Keras**.** Expertise in **UML** based object oriented modeling and design. Background in developing mobile applications for the **iOS platform** and in developing **Java based applications**. Want to define my future career in Machine Learning.

## EDUCATION

**Master of Computer Science (1999)**
University of Illinois at Urbana-Champaign, Urbana-Champaign, Illinois, USA

**BS, Engineering and Applied Science (1991)**
Focus Area: Computation and Neural Systems
California Institute of Technology, Pasadena, California, USA

**BA, Physics (1991)**
(Joint Dual-Degree with the California Institute of Technology)
Pomona College, Claremont, California, USA

## PROFESSIONAL EXPERIENCE

**Founder • ml4debugging,** Noida, India • 2018 - now

- ml4debugging is based on an innovative and seminal idea, to use machine translation to translate the error messages of an interpreter into natural language, using Recurrent Neural Networks.
- The project is hosted at https://ml4debugging.github.io.

**Founder • Tuitsoft,** Noida, India • 2017 – 2018

- Tuitsoft is a web based software service that simulates an intelligent tutor in teaching mathematical problem solving skills to school going students, by engaging the student in an interactive dialogue.

**Chief Technology Officer • Banyan Logic,** Noida, India & Virginia, USA • 2014 – 2017

- Banyan Logic offered consulting services for the implementation of Customer Relationship Management (CRM) products. My role was to take responsibility for the company's deliverables.

**Independent Software Consultant,** Noida, India • 2001 – 2014

- Worked on a wide variety of projects, using a wide variety of technologies such as UML, J2EE, J2ME, Visual C++, Xcode, Objective-C, iOS, java-cc, etc.
- Worked in a variety of roles, mostly as an individual programmer, but also in Technical Lead and Senior Architect roles.
- I have avoided getting into the details of individual projects so that I can focus this resume on my immediate goal, which is to work on Machine Learning/Neural Networks.

**Technical Lead • TechSpan (now Genpact)**, Noida, India • 1999 – 2001

**Tutor •** New Delhi, India • 1994 – 1998

- Tutored students in mathematics, science, and computer science, and also gave training in software engineering and programming languages to prospective software professionals.

**Software Engineer (Neural Networks) • California Scientific** • Nevada City, CA, USA • 1991 – 1994

- Developed neural network pattern recognition software, and implemented pattern recognition solutions for companies.
- Came up with an innovative way to classify one dimensional signals such as biomedical signals using back-propagation perceptron neural networks using the signal structure or morphology.
- Was on an internationally constituted editorial board for the “Handbook of Neural Computation”, a publication jointly published by Oxford University Press and the Institute of Physics.

**Technology:** C++ for the DOS/Windows 3.1 platforms, BrainMaker Neural Network Simulation Product.

**Research Assistant • Pine Lab, California Institute of Technology,** Pasadena, CA, USA • 1990 – 1991

- Built an electronic interface between live biological neurons in a silicon array, and a lab computer.

**Summer Undergraduate Research Fellow • Jet Propulsion Lab** • Pasadena, CA, USA • Summer, 1989

- Participated in an experimental project to bring the rocket engine technology of JPL (the space exploration laboratory owned by NASA and managed by Caltech) to the automobile industry.

## MACHINE LEARNING COURSES TAKEN

I took these five courses between August and December 2018 from the deeplearning.ai specialization hosted by Coursera and taught by Professor Andrew Ng of Stanford University. Courses taken and key topics are:

**Course: Neural Networks and Deep Learning**

- Mathematics of Gradient Descent and Back-Propagation
- Vectorization and Broadcasting in numpy
- Deep Neural Networks

**Course: Improving Deep Neural Networks: Hyperparameter tuning, Regularization, and Optimization**

- Train/Dev/Test Sets
- Dropout Regularization and Data Augmentation
- Mini-batch Gradient Descent
- Adam Optimization Algorithm
- Learning Rate Decay
- The Problem of Local Optima
- Hyperparameter Tuning
- Batch Normalization
- Softmax Regression
- TensorFlow

**Course: Structuring Machine Learning Projects**

- Orthogonalization
- Single Number Evaluation Metric
- Comparing to Human Level Performance
- Transfer Learning

**Convolutional Neural Networks**

- Computer Vision
- How to Compute Convolutions
- Object Detection and the YOLO Algorithm

**Sequence Models**

- Recurrent Neural Networks
- Back-Propagation through time
- Gated Recurrent Units (GRUs) and Long Short Term Memory (LSTM)
- Bidirectional Recurrent Networks
- Attention Model