Varsha
Kirani Gopinath

Curriculum Vitae

"All that we are is the result of what we have thought." –
Buddha

Info

Born	June 4th, 1991 at Sira,Tumkur (India)
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Education

2014 - present	**Master of Science in Machine Learning**, *KTH Royal Institute Of Technology*, Stockholm, Sweden.
	2 year programme, majoring in Machine Learning and Computer Vision. Other important courses include: Artificial Neural Networks, Artificial Intelligence and Information Retrieval.
2010 - 2013	**Bachelor of Science in Computer Science Engineering**, *M.S.Ramaiah Institute Of Technology*, Bangalore, India.
	4 year programme majoring in algorithms, computer architectures and basics of programming languages and platforms. Other courses included part of this program were Graphics and Visualisation, Discrete Mathematics, Database Systems and Operating Systems

Technical Skills

Languages	C++, JAVA, PYTHON, SQL, MySQL, SQLITE Latex, Javascript, HTML5, CSS3, Jquery, C, C#
Tools	Matlab, OpenGL, Visual Studio, Eclipse IDE, Netbeans IDE

Recent Coursework

- Artificial Intelligence
- Machine Learning-Advanced
- Artificial Neural Network
- Search Engine and Information Retrieval
- Applied Bioinformatics
- Image Based Recognition and Classification (May 2015)
- Visualisation (May 2015)

Projects and Abstracts

Hidden Markov Model based Video Game Agent for Duck Hunt

Artificial Intelligence

With different species of birds flying around in certain pattern, the agent was supposed to classify the bird according to the species and predict its next move to shoot it down. Both prediction and classification was done using HMMs. Each bird was learned using Baum Welch Algorithm of HMMs and were placed in its species list. The classification of the new bird is done using forward algorithm.

Improving Elevator Performance Using Reinforcement Learning

Machine Learning

The challenge was to learn an optimum elevator operation policy from experience, in order to reduce the travel overhead and improve passenger service. We constructed an Artificial Neural Network to learn a map from the passenger demand scenario to the action sequence an elevator must take. We used Q-Learning for blah blah blah in blah blah blah to achieve blah blah blah. We also, simulated an elevator-calling system including a visualisation. (5 member team)

Predicting Signal Peptides in Protein using Hidden Markov Model

Applied Bioinformatics

The goal was to predict whether the protein contains signal peptide or not which is used in localization of proteins in the cell to do their job properly. This was supervised learning where the training data is real world data extracted from Ensembl's BioMart service. Each protein from training data is represented as Hidden Markov Model(HMM) and all the HMMs were converged using Baum Welch Algorithm by maintaining the proteins in two clusters(with and without signal peptide). The new unseen protein is classified using Forward Algorithm. I also used BioPython to extract the data into required format.

Comparison of different methods for Search Engine of DavisWiki

Search Engine and Information Retrieval

For DavisWiki corpus, a search engine was built where one can search for documents which has main searching facilities like intersection query, phrase query, tf-idf ranked retrieval , page rank retrieval and combination of any two. The main intention was to learn different methods in search engine and information retrieval.

Generating Wardrobe Tips depending on Weather using Natural Language Generator

Artificial Intelligence

The aim was to build an application which gives wardrobe tips according to weather condition. We developed treebank trained statistical generator using context free grammar(CFG) and raw corpus to create probabilistic CFG (PCFG). Using this PCFG, different generators (Greedy, Viterbi,n-gram) produces sentences or phrases(wardrobe tip). We also implemented naive generator called probabilistic generator where sentences are generated according to probabilities of rules in PCFG at every step of treebank. Evaluation of the application was done using cross validation method where String-edit and BLEU methods are used. Human survey was also taken. (4 member team)

Self Organizing Map to solve Traveling Salesmen Problem using Artificial neural network

Artificial Neural Network	The challenge was to find the shortest path for the given number of cities. This was done using self organizing map (SOM) algorithm using artificial neural network. For various values of parameters (like neuron number, epochs, learning rate etc), SOM algorithm is analyzed.

Train systems using JAVA and SQL

Programming	A simple application of train system where both passengers and admin were able to get information about the trains like arrival time, departure time,complete route map and other info were made available. The main intention of the project was to explore JAVA functionalities and Database Management Systems.(2 member team)

Jumble Mumble, the word game in C#

Programming	It is a simple word game where user is given jumbled letters and asked to form multiple words. Scores were given according to length of the word and also weights on each alphabet. The whole application was done using C# and .Net assemblies using Visual Studio.(2 member team)

Building Node Intelligence in MANETs for Efficient Routing

Bachelor Thesis	As single protocol will not serve all the purposes required for communication in MANETS, switching between protocols can resolve this problem but builds up an overhead in the network as it need an external agent to monitor the environment and dictate to the network on which protocol should be chosen. Thus,the nodes present in the network can be made intelligent enough to sense its environment and select the suitable protocol ,that is , the switching can be done at the node level itself so as to reduce the overhead in the network and to make the routing more efficient. For real time scenarios and simulations we used NS2.35 simulator. AODV and DSDV protocols are considered. Node density and the pause time of the environment are taken as the cost metrics. At the learning phase, we learn about protocol which better fits at different scenarios. According to this result switching is done at node level to chose the protocol.(4 member team)

Publications
Building Node Intelligence in MANETs for Efficient Routing

year–year	**degree or job title**, *institution or employer*, city, grade. description

Industry Experiences

Work

2013–2014	**Associate Software Developer**, *SAP Labs India*, Visualization Recommendation Team, Bangalore. I worked in the *Business Intelligence Team* at SAP Labs, India - contributing to the development of *Lumira*. *Lumira* is a data analysis tool which provides efficient visualisations of large data focussed on businesses and economics. The main scientific challenge was to recommend the best visualisations depending on the data provided. I learnt to code in the Model-View-Controller software pattern of coding. Working in a corporate environment has also improved my teamwork skills and discussion-for-consensus capabilities.

Internship

Feb 2013 - Jun 2013	**ABAP-Language programmer**, *SAP Labs, India*, Team- Student Life Cycle Management, Bangalore. I worked on a database product for Student-Life-Cycle-Management. Vital technical challenges were the understanding of the workflow of the entire product and growing agility in using Advanced Business Application Programming (ABAP) language.

Interests and Hobbies

I love any sport but I prefer Badminton and Table Tennis. I love social gathering and interested in spending time with people more. Love gaming and a big time gay NARUTO fan.