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EDUCATIONAL
QUALIFICA-
TIONS **University of Saarland**, Saarbruecken, Germany
Bachelors in Computational Linguistics (April, 2002 – present).
(Results awaited.)

Bangalore University, Bangalore, India.
Masters in English Language and Literature (1999 – 2001).

Mahatma Gandhi University, Kerala, India.
Bachelors in Communicative English (1996 – 1999).

COMPUTER
SKILLS During my Bachelors study in computational linguistics, I have learned program-
ming in Prolog and Standard ML. I can work well with Unix and Linux platforms.
Apart from the commonly used softwares in scientific writings and presentations, I
have experience with the professional authoring/publishing softwares like L^AT_EX.

TALKS
GIVEN · X-Bar theory – Formal Syntax of Chomsky Tradition.
· Modeling Problem Solving in Human-Computer Interaction.
· Collaborative Tutoring of Procedural Tasks using COLLAGEN.
· Off-line measures in Human Speech Production.

LANGUAGE
SKILLS I am proficient in Malayalam (mother tongue), English, Hindi and German. Through-
out my education from schooling till Masters, English was the medium of instruc-
tion. German was the medium of instruction for my Bachelors in Computational
Linguistics.

M.A IN
ENGLISH My Masters studies pertained to courses in modern English structure & usage, lit-
erary criticism, English for literary study, English literature (European and Amer-
ican), Indian writing in English, Modern Indian Literatures (Translations from
Bengali, Kannada and Malayalam literatures) and Commonwealth Literature.

B.A IN
COMMUNICATIVE
ENGLISH

In my Bachelors I studied Remedial English grammar, applied phonetics, conversational English, sociology, English poetry, mass media & journalism and Malayalam language.

B.SC IN
COMPUTATIONAL
LINGUISTICS

The details of my courses in this field of study are as follows.

Foundations in Computational Linguistics: As mathematical foundational courses, we studied courses primarily concerned with set theory, propositional logic, predicate logic etc. We also got introduced to the theory of formal languages, automatas and turing machines. In *statistical natural language processing* we were taught concepts like corpus linguistic analysis of word distributions, collocation, statistical testing of hypothesis, information theory and probabilistic context-free grammars. Apart from the mathematical fundamental courses, there were also introductory courses offered in *general linguistics*, *computational linguistics*, *phonetics and phonology* and *psycholinguistics*.

Computer Science: *Standard ML* and *Prolog* were courses where we learned the basic concepts of programming. Programming tasks of varying degrees of toughness were administered in these courses. In Prolog, we did an advanced course in computational linguistic specific problems like implementation of finite state automata's for chunk parsing, active and passive chart parsers, question-answering systems based on semantic reconstruction. We also studied about feature structures, unification and generation techniques in Prolog. We also attended a course in *artificial intelligence* where we got introduced to different search strategies, expert systems, knowledge representations, semantic nets, neural networks, productions systems etc.

Syntax and Morphology: Here, we had had introductory courses in the field of *syntax and morphology*. This was supplemented with a course in *grammatical formalisms* where we learned about different grammar paradigms like lexical functional grammar (LFG), head-driven phrase structure grammar (HPSG), categorial grammar, dependency grammar etc.

Semantics and Discourse: We had courses in *semantics* where concepts like modal and temporal logic, type theory, lambda abstraction and conversion, relationship between syntactic and semantic structure of language were taught. *pragmatics and text-theory* dealt with the phenomenon of discourses and dialogues. Here we studied concepts like implicatures, presuppositions, speech acts, dialogue and discourse structures, reference and anaphoric relationships between discourse entities etc.

Seminars and Projects in Computational Linguistics: The following three seminars along with term papers were to be fetched as a part of our course work. The abstract of those seminars are given below.

X-Bar theory: A general scheme for Phrase Structure Rules: This seminar dealt with formal syntax in Chomskian tradition. We concentrated on the X-bar theory which is one of the fundamental components of the Government and Binding theory as proposed by Chomsky. We explain the theory formally, as well as the motivation behind the X-bar theory by considering the common patterns in the phrase structures and sentences. We also discuss the extension of X-bar theory to

different languages.

Collaborative Problem Solving in Dialogue Models for Practical Purposes: Here, we study and analyze existing dialogue models that are designed for practical purposes. The dialogue modeling issues of collaborative problem solving are discussed in detail in this seminar. We analyze the architecture of Collagen, a middle ware agent based on the collaborative discourse theory. We also discuss specific agents based on Collagen like PACO (intelligent tutoring agent). Collaborative agents based on multi-tasking is another aspect of this study. A specific intelligent agent WITAS, an unmanned vehicle, based on concept of multi-tasking is also discussed.

Off-line measures in Human Speech Production: This seminar falls under Psycholinguistic study of Human Speech Production processes and human cognition. We discuss three papers on off-line/unconscious processes of speech production. We see arguments for and against the independence of the stages of the grammar as well as the phonological production modules. The experiments took samples from the everyday speech errors like slip-of-the-tongues where people mispronounces some words resulting in the formation of nonsensical or legitimate words and errors like tip-of-the-tongue states where the speaker reports that he/she knows the word but cannot retrieve the phonological form of the word to articulate.

Software Project: *Black Jack Dealer – A Robot that speaks and plays cards.*

In this project, our team (of three) built a robot that can play the card game of Black Jack against a user / player as well as engage in a dialogue (in German) specific to the domain of this game. We designed and developed within the duration of 7 weeks, a basic version of the Black Jack dealer to play with one player and then extended with one more module which can sort the cards at the delivery point. We also discuss some future extensions for the robot, so as to accomodate more card games. The body of the Robot was made using Robotic Invention System kit of LEGO mindstorms building blocks. The Robot was then equipped with a small dialogue system which was developed as a commercial software called Diamant Dialogue System developed at the CLT Sprachtechnologie GmbH, Germany. Though the basic kit provides a graphical programming system for the central processing unit (RCX), we used a flexible third party RCX programming called LeJOS which allows a fine tuned programming using JAVA. In this project, we tried to incorporate the image recognition software as well as a dialogue system that enables communication between the robot and the human player. It is possible to extend the basic model of card-robot so that it can deal with more card games like Poker, Bridge etc.

Practical Training: *Annotation of anaphoric relationships between discourse entities.*

A six week long praktikum project was done under the project DIALOG (partly done at the Computational Linguistics Dept. University of Saarland) that develops a Tutorial Dialogue system which is a tutorial assistant for teaching mathematical proofs. My specific task was to identify and annotate different anaphoric relations as well as the discourse relations between the elements/entities in dialogues. We processed the discourse level referential elements and the anaphoric relations between these elements, together with ascription of syntactic as well as their semantic properties. To this end, we used the MMAX annotation tool developed at the NLP

group at the EML Research for annotating the dialogues.

Bachelor's Thesis: *Evaluation of the stochastic extension of a constrain-based dependency parser.*

This thesis presents the results of an experimental evaluation of a stochastic extension of the Extensible Dependency Grammar (XDG) solver, a constraint-based dependency parser. XDG is a formal framework for dependency grammar which supports the characterization of linguistic information along multiple dimensions of description for phenomena like linear precedence, predicate argument structure, quantifier scope structure etc. This parser uses A* search strategy to prune large search space of partial syntax trees and gives the best first parse within the least possible time. We tested the performance of the parser on sentences and grammars automatically acquired from the Penn Treebank and evaluated how stochastic guidance (acquired from the frequency informations from the Penn Treebank corpus) helps the parser to prune the search tree. As the performance parameters for the performance evaluation, we used: time taken for parsing, the maximum size of the agenda maintained by the A* search regime, the number of failed nodes in the search tree and number of solutions encountered during the traversal of the search space. The stochastically enhanced XDG (SXDG) parser's search strategy is significantly superior compared to the exhaustive search approach, which enumerates all solutions. We believe that techniques like smoothing (or statistical discounting) and also modifying the constraint solver such that constraint distribution is guided by the statistical information from the corpus could further improve the performance of the parser.

PERSONAL
DATA

I am 26 years old (DOB: 10th June 1978). I am an Indian citizen.

HOBBIES

My hobbies include photography, painting, music, traveling and working with my Linux machine.