

Rohit Kumar

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<http://speech.iit.net/~rohit/>

CAREER OBJECTIVE

To pursue and collaborate in research, development and teaching of technologies at academic / research oriented institutes and organizations and to work towards innovation of products for mass use

EDUCATIONAL BACKGROUND

Bachelor of Engineering (in Computer Science): August 1999 – May 2003

Percentage: 71.36% (1st Div. with Honors, Silver Medal) *College:* Punjab Engineering College, Chandigarh

Intermediate (Junior College): June 1997 – May 1999

Percentage: 84% (1st Division)

School: DAV Sr. Secondary School, Chandigarh

Matriculation (Class – 10): May 1996 – April 1997

Percentage: 66% (1st Division)

School: Shishu Niketan School, Chandigarh

WORK / RESEARCH EXPERIENCE

July 2004 – Presently Research Scientist (promoted)

LTRC IIT Hyderabad

July 2003 – June 2004 Research Engineer

LTRC IIT Hyderabad

Involved in research and development of Speech Systems (TTS, ASRs) and related Modules, Applications, Interfaces, Engines for Indian Languages

December 2002 – January 2003 Winter Intern, 2002

LTRC, IIT Hyderabad

Contributed to development of Unrestricted Domain Text to Speech Systems for Indian Languages and Low Memory Device Synthesizer

June 2002 – July 2002 Summer Intern, 2002

LTRC, IIT Hyderabad

Contributed to development of Unrestricted Domain and Limited Domain Text-to-Speech systems and developed speech output applications for Simputer

AWARDS AND ACHIEVEMENTS

IEEE Computer Society Richard E. Merwin Student Scholarship 2003

- Every year upto four students world over are selected to be recognized and rewarded for active leadership in IEEE Student branch chapters

Silver Medal for Best Final Semester Project

- The silver medal for Best Final Semester Project in Department of Computer Science and Engineering awarded to me at 33rd Annual College Convocation, 2004

Student Programming Contests

- 1st prize in Pre-defined software contest in PECFest 2001 (PEC technical festival 2001)
- 1st prize in On-the-spot software contest in PECFest 2001
- 2nd prize in Debugging contest in PECFest 2001
- 1st prize in Pre-defined software contest in Panoplia (PEC technical festival 2000)

State Science Exhibitions

- 3rd prize in State Science Exhibition, Chandigarh, in 1998 for projects on Traffic control by computers
- 1st prize in State Science Exhibition, Chandigarh, in 1997 for projects on Role of IT in Education

PUBLICATIONS (<http://speech.iit.net/~rohit/publications.htm>)

Journals:

- Rahul Jindal, Rohit Kumar, Ritvik Sahajpal, Sanjeev Sofat, Shailendra Singh, "Implementing a Natural Language Conversational Interface for Indian Language Computing", to appear in IETE Journal of Technical Review, July – August 2004

Conferences:

- Rohit Kumar, S. P. Kishore, "Automatic Pruning of Unit Selection Speech Databases for Synthesis without loss of Naturalness", Accepted for Full Presentation at International Conference on Spoken Language Processing (INTERSPEECH - ICSLP) 2004, Jeju, Korea

- Rohit Kumar, “Genetic Algorithm for Unit Selection based Speech Synthesis”, Accepted for Full Presentation at International Conference on Spoken Language Processing (INTERSPEECH - ICSLP) 2004, Jeju, Korea
- Sebsibe H/Mariam, S P Kishore, Alan W Black, Rohit Kumar, Rajeev Sangal, “Unit Selection Voice for Amharic using Festvox”, in Proceedings of 5th ISCA Speech Synthesis Workshop (SSW5), June 2004, Pittsburg, PA
- Rohit Kumar, Amit Kataria, Sanjeev Sofat, “Building Non – Native Pronunciation Lexicon for English using a Rule based Approach”, Presented at International Conference on Natural Language Processing (ICON) 2003, Mysore, India
- Rohit Kumar, Anuj Singla, Sanjeev Sofat, “Samachar Vaani: A Framework for providing Automated Spoken News Service”, Presented at Sixth International Conference on Information Technology (CIT) 2003, Bhubaneswar, India
- S. P. Kishore, Alan W. Black, Rohit Kumar, Rajeev Sangal, “Experiments with Unit Selection Speech Databases for Indian Languages”, Presented at National Seminar on Language Technology Tools: Implementation of Telugu, October 2003, Hyderabad, INDIA
- S. P. Kishore, Rohit Kumar, Rajeev Sangal, “A Data-Driven Synthesis Approach for Indian Languages using Syllable as Basic Unit”, Presented at International Conference on Natural Language Processing (I C O N) 2002, Mumbai, INDIA

Technical Contributions to Student Publications and Contests in College:

- Rohit Kumar, “A Framework for E – Governance in India with Local Language Support”, in student paper contest organized by National Productivity Council, February 2003, Chandigarh, India
- Rohit Kumar, “Observing and being a part of Evolution of Language: Some Random Thoughts”, for IEEE Computer Society Student Chapter Bi Annual Publication POTENTIAL, vol. II, 2003
- Rohit Kumar, “Data Driven Approaches: A Basis for Everything”, for P.E.C. Student Magazine: PECMag 2003

RESEARCH PROJECTS UNDERTAKEN (<http://speech.iiit.net/~rohit/projects.htm>)

Speech Data Collection for Indian Language ASR Systems (<http://speech.iiit.net/~asrproject/>)

Project Funded from HP Labs India *Duration: June 2004 – Ongoing*

- Collection of huge Text Corpus of Indian Languages and Optimal Text Selection
- Developed a Telephonic Interface for Speech Data Collection using Dialogic Cards on Windows Platform

Khabrein: Online Hindi News Channel (<http://ltrc.iiit.net/~rohit/>)

Independent Research *Duration: February – June 2004*

- Developed an Indian Language News Search Engine
- Several issues like Font and Format Unification, Document Classification, Web site specific crawlers, Web based Speech Out Interface have been addressed

GASpSynthesizer

Independent Research *Duration: August – September 2003*

- Developed a Genetic Algorithm based approach for Unit Selection for Concatenative Speech Synthesis
- Choice of Appropriate Fitness Functions; Size of Initial Population; Implementation of Selection, Combination, Elitism and Mutation operators are some of several issues that are experimented

Unit Pruning in Speech Database without loss of Naturalness

Independent Research *Duration: August – September 2003*

- Developed an approach to prune away units which do not contribute to prosodic coverage of the units or the prosodic coverage provided by which is rarely required (statistically)
- Experiments conducted to find the optimum extent of pruning without significant loss of naturalness

PECMail: Email Client for Hindi (with Speech Support) - Application Development Project

Project Guide: Mr. Sanjeev Sofat *Duration: January – May 2003*

- A basic Email Client with Support for sending and receiving mails in Hindi besides English
- Incoming mails in Hindi are read out by the client
- A GUI based keyboard for typing Hindi for users unaware of Hindi Keyboard Layout

Rule based Approach for Building Non Native Pronunciation Lexicon using a Native Lexicon

Independent Research

Duration: February – May 2003

- Correspondence between Native and Non Native Pronunciations of English modeled
- Generic Algorithm for mapping Graphemes to Phonemes in a word's pronunciation developed
- Experimented with Example based Approach for automatically building rules

Low Memory Device Synthesizer

Project Guide: Mr. S. P. Kishore

Duration: December 2002 – January 2003

- Developed a Low Memory Device Synthesizer for Simputer (Handheld Computer) for Indian Languages
- Good Quality Speech Synthesis is achieved for Database Size as small as 1.4 MB

Samachar Vaani: News Reader - Application Development Project

Project Guide: Mr. Sanjeev Sofat

Duration: August – December 2002

- Developed a News Reader Software that reads out latest news from BBC Hindi News Websites
- A flexible Server / Reader Framework was proposed that would enable any news service provider to provide spoken news service using Automatic Speech Synthesis

Indian Language Speech Synthesizer based on Data Driven Approach (<http://speech.iit.net/>)

Project Guide: Mr. S. P. Kishore

Duration: June – July 2002

- Contributed to development of a Generic Unrestricted Domain Synthesizer for Indian Languages using Syllable level Unit Selection & Concatenation on lines of the Limited Domain Synthesizer

Continued System Development

Duration: August 2003 – February 2004

- More recently, a robust API for the Indian Language TTS has been implemented to facilitate application development using the system in Windows
- Support for all the most common Fonts and Notations for Hindi, Telugu incorporated
- Preliminary Text Normalization Architecture and Modules implemented

Limited Domain Speech Synthesizer Synthesizer

Project Guide: Mr. S. P. Kishore

Duration: June – July 2002

- Contributed to development of a Generic Limited Domain Synthesizer for Indian Languages based on Syllable level Unit Selection
- Related Applications 1. Talking Tourist Aid (for Simputer) 2. Talking Clock

Deepti: Computing Time Companion (<http://deepti.nourl.org/>)

Project Guide: Mr. Sanjeev Sofat

Duration: February – May 2002

- Developed an Intelligent Hindi Speaking Agent with speech out capability using diphone databases
- Used AIML based Dialog Engine and Integrated with Festival
- One of the firsts to develop Diphone based Voice for Hindi in India using Festvox
- This project was featured on BBC World Service and Asia Service and in several national publications

COMPUTING SKILLS AND EXPOSURE

Languages: C / C++ / VC++, HTML, CGI – Perl, Python
Operating Systems: Linux, Windows NT/9X, DOS (core), SCO Unix, Solaris
Hardware Platforms: PCs, Sun Sparc Servers, Simputer (Strong ARM), Intel Dialogic
Toolkits/ Libraries: Qt, GTK+, STL, Sockets, Festvox Framework, Dialogic SR 6.0

- Sound knowledge of Data Structure, Algorithms, OOP Design Patterns
- Practical Exposure of networks/website/server administration, server end scripting (Linux)

PROFESSIONAL MEMBERSHIPS AND ACTIVITIES

IEEE Computer Society

- Founder Secretary of IEEE Computer Society Student Branch Chapter at my college for the 2002 – 03
- Have played a key role in establishing and building up the student branch chapter through its initial years
- Student Member since July 2001

IEEE

- Student Member of IEEE since July 2001

Extra – Curricular Activities

- Co – opted member of College's Student Council 2002 – 03 for excellence in technical activities
- Graphics Editor of PEC Editorial - Board for year 2002 – 03
- Coordinator of National Service Scheme (NSS) PEC Unit during 2000 – 2001
- Web-Admin for College Website during 2002 – 03