



# AmrithKrishna

Computational Linguist | IIT Kharagpur, India

## Research

I am currently in fourth year of my PhD at the Dept. of Computer Science and Engineering, IIT Kharagpur, India. I am advised by Prof. Pawan Goyal in the field of Sanskrit Computational Linguistics, I am expected to graduate by May 2019.

### Text Segmentation in Sanskrit Texts

In Sanskrit texts, words are often joined together making phoneme level changes at word boundaries. We formalise the problem as a structured prediction task, that searches for Maximal Clique by using a deep energy based model.

### Structured Prediction for Free Word Order Languages

The configurational information of words in a sentence is of no practical value for constructs in Free word order languages. We formalise a energy based framework for tackling structured prediction tasks in such languages. The tasks under the framework can be reduced as searching for specific substructures in a graph.

### Program Synthesis for Natural Languages

A program can be seen as an efficient combination of a computable function (computation) and stored data (memoization). We use Automata minimisation approaches and Minimum Description Length as our policy and optimisation measures for inducing programs for tasks related to morphology and phonology in natural languages.

## Publications

**Krishna, Amrith** ; Santra, Bishal ; Bandaru, Sasi Prasanth ; Sahu, Gaurav ; Sharma, Vishnu Dutt ; Satuluri, Pavankumar ; Goyal, Pawan. Free as in Free Word Order: An Energy Based Model for Word Segmentation and Morphological Tagging in Sanskrit. Proceedings of the 2018 Conference on Empirical Methods in Natural Language Processing, EMNLP 2018. Brussels, Belgium. [Code](#) | [paper](#)

**Krishna, Amrith** ; Majumder, Bodhisattwa P. ; Bhat, Rajesh ; Goyal, Pawan. Upcycle Your OCR: Reusing OCRs for Post-OCR Text Correction in Romanised Sanskrit. Proceedings of the 22nd Conference on Computational Natural Language Learning, CoNLL 2018.Brussels, Belgium. [Code](#) | [paper](#)

Reddy, Vikas; **Krishna, Amrith**; Sharma, Vishnu; Gupta, Prateek; M R Vineeth; Goyal Pawan. Building a Word Segmenter for Sanskrit Overnight. In International Conference on Language Resources and Evaluation 2018, Miyazaki, Japan. [Code](#) | [paper](#)

**Krishna, Amrith**; Majumdar, Bodhisattwa; Goyal Pawan. An 'Ekalavya' Approach to Learning Context Free Grammar Rules for Sanskrit Using Adaptor Grammar. In 17th World Sanskrit Conference – July 9-13, 2018 Vancouver, BC.

**Krishna, Amrith**; Satuluri Pavankumar; Goyal, Pawan (2017). "A Dataset for Sanskrit Word Segmentation" in Joint SIGHUM Workshop on Computational Linguistics for Cultural Heritage, Social Sciences, Humanities and Literature, 55th Annual Meeting of the Association for Computational Linguistics (ACL), Vancouver,Canada 2017. [Dataset](#).

**Krishna, Amrith**; Satuluri, Pavankumar; Ponnada, Harshavardhan; Ahmed, Muneeb; Arora, Gulab; Hiware, Kaustubh; Goyal, Pawan (2017); A Graph Based Semi-Supervised Approach for Analysis of Derivational Nouns in Sanskrit. in Proceedings of TextGraphs 11 Workshop, 55th Annual Meeting of the Association for Computational Linguistics Vancouver (ACL) ,Canada 2017 (accepted).[link](#).

### Address

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<https://krishnamrith12.github.io>

### Social Presence

Linkedin  
Twitter  
Stack Overflow  
Github

## Education

### Ph.D

2015 - (Pursuing)  
IIT Kharagpur

### M.Tech

2013 - 2015  
IIT Kharagpur

CGPA 9.27

### B.Tech

2008 - 2012

FISAT

Aggregate 76.10 %

**Krishna, Amrith**; Satuluri, Pavankumar; Sharma, Shubham; Kumar, Apurv and Goyal, Pawan (2016). Compound Type Identification in Sanskrit: What Roles do the Corpus and Grammar Play? WSSANLP, Workshop at COLING 2016, Osaka, Japan, Dec. 11-16. [link](#).

**Krishna, Amrith**; Santra, Bishal; Satuluri Pavankumar; Bandaru, Sasi Prasanth; Faldu , Bhumi; Singh, Yajuvendra; Goyal, Pawan; "Word Segmentation in Sanskrit Using Path Constrained Random Walks" in COLING 2016. [link](#).

**Krishna, Amrith**; Mallick, Madhumita; Mitra, Bivas; "SleepSensei - An automated sleep quality monitor and sleep duration estimator." in In IoT of Health Workshop, Mobisys 2016

Chakraborty, Tanmoy; **Krishna, Amrith**; Singh, Mayank; Ganguly, Niloy; Goyal, Pawan and Mukherjee, Animesh. "FeRoSA: A Faceted Recommendation System for Scientific Articles." in PAKDD 2016. [link](#). | [www.ferosa.org](http://www.ferosa.org).

**Krishna, Amrith** and Goyal, Pawan. Towards automating the generation of derivative nouns in Sanskrit by simulating Panini. 16th World Sanskrit conference, Sanskrit and the IT world, 2015. [link](#).

**Krishna, Amrith**; Bhowmick, Plaban; Sahu, Archana; Ghosh, Krishnendu; Roy, Subhayan. "Automatic Generation and Insertion of Assessment Items in Online Video Courses." In Proceedings of the 20th International Conference on Intelligent User Interfaces Companion, pp. 1-4. ACM, 2015. [link](#).

## Awards and Recognitions

- Selected for Google NLP Summit, Zurich to be held on September 25 to 27.

- Won numerous travel grants including Microsoft Travel Grant, EMNLP Travel Grant, ACM-IARCS Travel Grant, CNeRG Travel Grant and Institute International Best Conference travel grant for presenting our published works on the respective venues.

- Won grant of Rs. 5,00,000 for the project 'IndicView', from National Level Google IIT Pilot program. Septemeber 2014 - 2015.

- Stood among the top 0.080 % students in the Graduate Aptitude Test in Engineering, GATE 2013 CS with All India Rank 180 of 2,24,160 candidates

- Received best demo award in IBM Day, IIT Kharagpur on 29th August 2015

- Finalist at Samsung Innovation awards at IIT Kharagpur, Oct. 2014,

- First runner up at Google Hackathon 2013 by the Google Developer Group, Kolkata.

- Recipient of 'Special Recognition award' for excellence in B.Tech from FISAT in 2012.

## Education

Since Jul '15 **PhD Student, CNeRG, Dept. of CSE, IIT Kharagpur**

Broad Area of Research: Sanskrit Computational Linguistics.

Thesis Advisor: Prof. Pawan Goyal. Department of Computer Science and Engineering, IIT Kharagpur.

2013 - 2015 **M.Tech in CSE**  
**IIT Kharagpur**

CGPA 9.27

2008 - 2012 **B. Tech in Computer Science & Engineering**  
**FISAT - Federal Institute of Science & Technology,**  
MG University, Kottayam, Kerala

Aggregate - 76.10 %

## Current Research Areas

- Program Synthesis
  - Energy Based Models
- Inductive Logic Programming
  - Sanskrit Computational Linguistics

## Relevant Courses

- Natural Language Processing
- Language Processing in E-Learning
- Information Retrieval
  - Machine Learning
  - Complex Networks

## Teaching Assistantship

- Deep Learning
- Natural Language Processing ([Jupyter Notebooks](#))
- Information Retrieval ([Jupyter Notebooks](#))
- Computing Lab- I and II

## Talks

### Programming

Python ★★★★★

C ★★★★★

PHP/HTML5 ★★★★★

CSS/JS ★★★★★

### Libraries

Scipy/Numpy

Scikit-Learn

Pandas

TensorFlow

CNTK

NLTK

- Synthesising Grammars Programs for Natural Language from Data at International Seminar on Paradigm Shift in Indian Linguistics and its Implications for Applied Disciplines, IAS Shimla, 30 Oct - 1 Nov 2017.

- “Hangman with Language Models”, Hands-on Lab session at the ACM Summer School on Natural Language Processing and Machine Learning, IIT Kharagpur, 9th July 2017

- “ A Dataset for Word Segmentation in Sanskrit”, Talk at the Workshop for Bridging the gap between Sanskrit Computational Linguistics tools and management of Sanskrit Digital Libraries, ICON, Dec. 18th 2016, IIT-BHU.

- “Automated Sanskrit Text Segmentation Aided by Statistical Analysis”, Talk at ASTRA International Conference 2016, Deccan College, Pune.10th January 2016.

- “Named Entity Recognition in Bhagavatham with Rich Linguistic Features.”, Talk at ASTRA International Conference 2016, Deccan College, Pune.10th January 2016.

## Teaching and Leadership Experience

July'17-Nov'17 **Teaching Assistant, Natural Language Processing**

Lecture Session on Lexical Semantics, Information Extraction & Entity Linking. [Kaggle Link](#).

Since July '17 **Web Chair - Data Science in India, KDD 2017**

Web-Chair for IKDD event 'Data Science in India', colocated with KDD 2017.

Since May '17 **Web Chair - CODS-COMAD 2018, 2019**

Web-Chair for The joint conference of 5th ACM IKDD Conference on Data Sciences and the 23rd International Conference on Management of Data (COMAD), to be held at Goa University on January 11 - 13, 2018.

Jul'15-May'18 **Webmaster - CNeRG**

Visit [www.cnerg.org](http://www.cnerg.org)

Jan '17-May '17 **Teaching Assistant, NPTEL online course on Natural Language Processing**

Teaching Assistant for the online course hosted at NPTEL. [Course Link](#).

Jul'15 - Nov'17 **Mentor - B.Tech and M.Tech Projects**

Mentored projects for 7 B.Tech Projects and 6 M.Tech Projects

## Technical Skills

**Programming Languages** - Python, C, PHP, HTML5, CSS/JS

**Operating System** - Linux ,Windows

**Libraries** - TensorFlow, Pandas, Cytoscape, Bokeh, NLTK, Scikit-Learn, Scipy, Numpy

**Natural Languages** - Malayalam (Native), English , Hindi , Sanskrit

## References

Dr. Animesh Mukherjee  
Associate Professor ,  
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Indian Institute of Technology, Kharagpur.  
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Dr. Pawan Goyal  
Assistant Professor  
Dept. of Computer Science & Engg.  
Indian Institute of Technology, Kharagpur.  
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