

My research interest is to apply machine learning algorithms to understand clinical text. In the clinical domain, it is important to make predictions explainable. Consequently, as my current focus, I am developing model-agnostic interpretability methods to better understand neural models and reason about their output predictions.

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## Education

Sep '16 – present **PhD in Computational Linguistics**

*University of Antwerp, Belgium.*

Supervisors: Prof. Dr. Walter Daelemans, Dr. Simon Šuster

Oct '13 – Feb '16 **Master of Science in Language Science and Technology**

*Saarland University, Germany, 1.5/5 (1.0 highest, lower is better).*

Thesis — Recognizing Textual Entailment

- Developed subword distance-based and embedded vectors-based lexical alignment algorithms to align text and hypothesis segments for textual entailment classification.

Supervisors: Prof. Dr. Günter Neumann, Prof. Dr. Dietrich Klakow

July '09 – May '13 **Bachelor of Technology in Computer Science and Engineering**

*VIT University, Vellore, India, 8.98/10.*

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## Work Experience

Dec '19 – Mar '20 **Research internship**

*Google Brain Applied team, Zürich, Switzerland.*

Host: André Susano Pinto

Apr '16 – Dec '17 **Junior Research Developer**

*Antwerp University Hospital, Antwerp, Belgium.*

Natural Language Processing for clinical applications (Project *Accumulate* funded by VLAIO, Belgium).

- Developed techniques for unsupervised patient representation learning with gradient-based analysis for model interpretability.
- Developed classifiers for automated psychiatric symptom severity identification.

Dec '13 – Nov '15 **Research Assistant**

*German Research Center for Artificial Intelligence, Saarbrücken, Germany.*

- Designed and implemented a textual entailment engine for English (Project *Excitement* funded by the EU).
- Designed and developed the website: <http://www.qt21.eu>.

Jan '13 – May '13 **SDE Intern**

*TCorpus Analytics, Technology Business Incubator, Vellore, India.*

- Designed and implemented an analytics platform for financial text data.

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## Publications

**Madhumita Sushil**, Simon Šuster, and Walter Daelemans. Rule induction for global explanation of trained models. In *Proceedings of the 2018 EMNLP Workshop Black-boxNLP: Analyzing and Interpreting Neural Networks for NLP*, pages 82–97. Association for Computational Linguistics, 2018.

Simon Šuster, **Madhumita Sushil**, and Walter Daelemans. Revisiting neural relation classification in clinical notes with external information. In *Proceedings of the Ninth International Workshop on Health Text Mining and Information Analysis*, pages 22–28. Association for Computational Linguistics, 2018.

**Madhumita Sushil**, Simon Šuster, Kim Luyckx, and Walter Daelemans. Patient representation learning and interpretable evaluation using clinical notes. *Journal of Biomedical Informatics*, 84:103 – 113, 2018.

**Madhumita Sushil**, Simon Šuster, Kim Luyckx, and Walter Daelemans. Unsupervised patient representations from clinical notes with interpretable classification decisions. *Workshop on Machine Learning for Health, NeurIPS, arXiv preprint arXiv:1711.05198*, 2017.

Elyne Scheurwegs, **Madhumita Sushil**, Stéphan Tulkens, Walter Daelemans, and Kim Luyckx. Counting trees in random forests: Predicting symptom severity in psychiatric intake reports. *Journal of Biomedical Informatics*, 75:S112 – S119, 2017. A Natural Language Processing Challenge for Clinical Records: Research Domains Criteria (RDoC) for Psychiatry.

Neha Tekriwal, **Madhumita Sushil**, and P. Venkata Krishna. Integration of safety and smartness using cloud services: An insight to future. In Khaled Elleithy and Tarek Sobh, editors, *Innovations and Advances in Computer, Information, Systems Sciences, and Engineering*, pages 293–303, New York, NY, 2013. Springer New York.

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## Activities

<b>Mentor</b>	Google Summer of Code '19 project on bias identification in machine learning models.
<b>Training</b>	Google's exclusive virtual technical development program — Get Ahead '19.
<b>Poster</b>	3rd Google NLP Summit, Zürich '19.
<b>Program committee</b>	Widening NLP (WiNLP) Workshop and Student Research Workshop at ACL '19. Workshop on Machine Learning for Health at NeurIPS '17, '18.
<b>Student board</b>	EACL '19 – '20.
<b>Summer school</b>	Lisbon Machine Learning school (LxMLS) '16.
<b>Volunteer</b>	Mentor to an under-privileged girl in rural India through the initiative <i>e-shishya</i> ( <a href="http://e-shishya.com/">http://e-shishya.com/</a> ), Jul '18 – Dec '18. Interspeech '15.
<b>Co-organizer</b>	Indian country evening, Saarland University, '14.
<b>Vice President</b>	Computer Society of India, VIT University, '11 – '12.
<b>Core committee</b>	Computer Society of India, VIT University, '09 – '11.

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## Awards

<b>Scholarship</b>	Google intern travel scholarship for Grace Hopper Celebration '19.
<b>Student achiever</b>	VIT University, '12.
<b>Finalist</b>	One of the top 22 teams across India in the <i>Intel India Embedded Challenge</i> '12 for the project <i>Smartphone for the visually impaired</i> .
<b>Winner</b>	Hackathon, <i>Exebit</i> '12, IIT Madras.