

Education

MSc in Artificial Intelligence, KU Leuven (graduated magna cum laude)

Sep ' 2017 - Sep ' 2018

Master thesis: Proposed and implemented a variant of the classic RankNet approach of ranking documents which personalises the results based on user profiles.

MSc (Integrated) in Mathematics, IIT Kanpur, India

June 2009 - May 2014

Master thesis: Analysis of middle censored data under a shifted exponential distribution

Professional Experience

PhD Researcher @ DTAI lab, KU Leuven, Belgium

Oct ' 2018- present

Topic: Machine Learning with Constraints: Towards Trustworthy AI; Advisor: Prof. Hendrik Blockeel

Learning Models that Provably Satisfy Domain Constraint (primary goal of the thesis)	<ul style="list-style-type: none">Developed a new framework and an optimisation algorithm to learn models that can guarantee domain constraint satisfaction (e.g., safety constraints, fairness constraints) for all possible predictions.Evaluation on various regression, classification and structured prediction tasks demonstrated that our approach, in contrast to existing approaches like regularization, is able to guarantee domain constraint satisfaction.
Music Playlist Generation (awarded the best paper at BNAIC'22)	<ul style="list-style-type: none">Working with industry partner <i>Tunify</i>, developed and implemented an approach that combines rule based classification with PU learning to automatically identify music playlists.Proposed a clustering based approach to identify new playlists from customer data, leading to an identification of more than 50 new playlists previously unidentified by the domain experts.
Iteratively Improving Tree Performance by Optimising Subtrees	<ul style="list-style-type: none">Proposed and implemented an approach to improve the performance of an already learned tree by optimising sub-trees iteratively.Demonstrated that the proposed approach improves the performance of CART and lookahead trees to close to optimal levels, while being tractable for deep trees.

Business Analyst - Zynga Games, Bangalore, India

April - Sep ' 2017

Analysed key performance metrics for multiple mobile games to provide insights for business strategies in addition to developing an in-house tool to perform A/B tests on newly rolled updates.

Business Analyst - Accenture Management Consulting, Bangalore, India

June 2014 - Mar ' 2017

Collaborated with multiple teams across the globe to provide business consulting services to clients in the fields of inventory optimisation, reliability management systems, social media analytics.

Data Analyst Internship - Media iQ Digital, Bangalore, India

May - July 2013

Developed forecasting models to predict digital impressions won by an airline carrier for a given bid.

Technical and Language Skills

General Skills	Programming	Python Data Science Stack	Languages
Machine Learning, Data Mining, Logic and Satisfiability, Combinatorial Optimisation, Computer Vision	Python, R, Java, SQL	ML: Scikit-learn, numpy, pandas, pytorch Visualisation: matplotlib, seaborn, altair Parallelisation: scoop, dask	English (full professional proficiency) Hindi (native proficiency)

Publications

1. SaDe: Learning Models that Provably Satisfy Domain Constraints. ([pdf](#)) *ECML 2022*
K. Goyal, S. Dumancic, H Blockeel
2. Automatic Generation of Product Concepts from Positive Examples. ([pdf](#)) *BNAIC 2022*
K. Goyal, W. Meert, H Blockeel, E. V. Wolputte, K. Vanderstraeten, W. Pijpops, K. Jaspers
3. Feature Interactions in XGBoost. ([pdf](#)) *AIMLAI-ECML 2019*
K. Goyal, S. Dumancic, H Blockeel
4. DeepSaDe: Learning Neural Networks that Guarantee Domain Constraint Satisfaction ([pdf](#)) *(under review)*
K. Goyal, S. Dumancic, H Blockeel

Leadership & Awards

- Teaching assistant for three courses: taught exercise sessions and prepared assignments *2018 - 2022*
- Thesis advisor to 5 master students: projects in areas of **personalised search, music streaming, game theory & constrained learning** *2018 - 2022*
- Department representative for the thesis administration for MSc Computer Science at KU Leuven *2019 - 2022*
- Research paper **reviewer** for ECML'19 and ECML'22
- Received the **best paper award** at BNAIC'22
- Awarded **2nd prize** at the KU Leuven Datathon *2017 - 2018*
- Awarded the prestigious **INSPIRE** undergraduate scholarship by the government of India *2009 - 2014*