# Anil Goyal

*Principal Research Scientist at BUDDIHealth*

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## Work Experience

**Aug, 2020– present**   **Principal Research Scientist**, *BUDDIHealth*, Chennai, India.

**Oct, 2018–Aug, 2020**   **Research Scientist**, *NEC Laboratories Europe*, Heidelberg, Germany.
- **Project Management:**
  - **European Union Project COREALIS :** Leading the development and productization of models for predictive maintenance and travel time prediction tasks for trucks operating at European sea ports using meta learning for ensemble methods.
  - **Business Unit Projects:** Leading the development of algorithms for projects on driver drowsiness detection (using multi-task learning) and predictive maintenance task (using ensemble learning).
- **Research & Development:**
  - Designed and developed an ensemble learning based algorithm for imbalanced binary classifications tasks (applied to predictive maintenance, credit fraud detection, webpage classification and medical tasks). Filed a patent and accepted international paper.
  - Designed and developed a continual learning based ML algorithm.
  - International Publication: IJCNN 2020 (CORE RANK A).
- Responsible for developing interactive **visualizations** for developed methods.
- Utilized **Design Thinking** principles to solve wicked problems in public safety domain.

**Nov, 2015–Oct,2018**   **Doctoral Researcher**, *LIG, Grenoble and LaHC, Saint-Etienne*, France.
- Designed and developed 3 multiview learning algorithms using PAC-Bayesian theory and ensemble learning.
- Experimented on text (written in 5 languages) and image (with 4 views) datasets. Showed significant improvement in prediction performance compared to state-of-art methods.
- Actively involved in French ANR Project LIVES.
- International publications: Neurocomputing Journal 2019, IDA 2018 (CORE Rank A), ECML-PKDD 2017 (CORE Rank A).
- National publications: CAp 2018, CAp 2017, CAp 2016.

**Aug–Oct,2015**   **Data Science Engineer**, *Cube26 Private Limited*, New Delhi, India.
Developed algorithms for aggregation of similar news articles from different sources and finding the appropriate advertisement banners for the news articles for Neon News android application.

**Feb–Jun,2015**   **Research Intern**, *Laboratoire d'Informatique de Grenoble (LIG)* , Grenoble, France.
- **Masters Thesis** at AMA team, LIG, Grenoble under the guidance of Prof. Massih-Reza Amini.
- Designed and developed an algorithm for learning information retreival models' parameters using transfer learning approach from a labeled source collection to an unlabeled target collection.
- Publication at French Machine Learning Conference CAp 2015.

**May–Aug,2014**   **Software Developer**, *Pyramid Cyber Security & Forensics Private Limited*, New Delhi, India.
Designed and developed an algorithm to detect frauds (made using erasable ink pens) in back cheques for Punjab National Bank, India.

**May–Jul,2013**   **Research Intern**, *University of Hyderabad*, Hyderabad, India.
- Designed and developed an algorithm to find number of clusters in short text documents using Ncut-term weighing scheme and spectral clustering (under the guidance of Prof. Arun K. Pujari).
- Publication at IEEE conference NCVPRIPG 2013.

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| May–Jul,2012 | **Developer Intern**, *Institute of Nuclear Medicine & Allied Sciences (INMAS), DRDO*, Delhi, India.<br>Designed and developed Leave Management System and Document Dispatch System using PHP, MySQL, HTML and CSS. |

## Education

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| 2015–2018 | **Ph.D. in Machine Learning**, *Université de Lyon*, Lyon, France,<br>**Supervisors:** Prof. Massih-Reza Amini and Dr. Emilie Morvant.<br>**Subject:** Learning a Multiview Weighted Majority Vote Classifier: Using PAC-Bayesian Theory and Boosting. |
| 2014–2015 | **Masters of Science in Informatics (MOSIG)**, *ENSIMAG, Grenoble INP*, Grenoble,France, *(with honors)*.<br>Subjects: Machine Learning, Information Access and Retrieval, Computer Vision, Advanced Human-Computer Interaction, Computational Geometry and Medical Imaging, Simulation & Robotics. |
| 2010–2014 | **Bachelor of Technology**, *The LNMIIT*, Jaipur, India, *CGPA − 8.69/10*.<br>Specialization: Computer Science and Engineering |

## Activities

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| R&I Projects | European Union Project **COREALIS** (Oct 2018 - present).<br>French **ANR LIVES** Project (Jan, 2016-September, 2018). |
| Student Supervision | **Soroush Seifi**, Subject:"A PAC-Bayesian Multiview Study", Laboratoire Hubert Curien, CNRS, Saint-Etienne, France (Apr–Jun,2016).<br>Co-supervised with Prof. Amaury Habrard and Dr. Emilie Morvant |
| Workshops | Design Thinking 2019, Proposal Writing for H2020 R&I Projects 2019, Deep Learning Workshop 2017,Computational and Statistical Trade-offs in Learning 2016 |
| Summer School | Gaussian Process and Uncertainty Quantification Summer School, 2019 |
| Teaching Assistance | **Database Management Course**, The LNMIIT, Jaipur, India (Jan-May,2012 & Jan-May,2013).<br>Co-advised with Prof. Subrat K. Dash |
| Coursera Courses | ○ Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization (Grade Achieved: 100.0%)<br>○ Neural Networks and Deep Learning (Grade Achieved: 100.0%) |

## Skills

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| Programming | Python, C, JAVA, MATLAB, SQL |
| Tools | ML tools (Scikit-learn, Numpy, Pandas, Jupyter notebook), Deep Learning (TensorFlow), Visualization (Plotly, Matplotlib, D3.js, Mapbox), Web Development (HTML, CSS, PHP, JavaScript, JSP), AWS (EC2), Terrier IR Platform |
| Project Management | Agile Methodology, Design Thinking, Experience in working in multidisciplinary teams |

## Patent Applications

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| 2020 | Tobias Jacobs and **Anil Goyal**, "Decentralized Multi-task Learning". |
| 2020 | **Anil Goyal**, Ammar Shaker and Francesco Alesiani, "A method for Machine Learning Knowledge Management based on life-long boosting in presence of less data". |
| 2019 | **Anil Goyal** and Jihed Khiari, "Diversity-Aware Weighted Majority Vote Classifier for Imbalanced Datasets" |

## Publications

Google Scholar Profile