Nina Hosseini-Kivanani

University of Luxembourg

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Personal Profile

PhD researcher specializing in NLP and computer vision, with expertise in AI evaluation and model interpretability. Experienced in developing tools that enhance the reliability and transparency of AI systems for practical applications. Motivated by opportunities to work collaboratively on impactful research that advances AI's role in real-world contexts.

Research Experience

University of Luxembourg, Luxembourg
Belval, Luxembourg

Automatic Speech Recognition for Luxembourgish (Lux-ASR) — *Oct 2022 - Present*

- **Speech Recognition Development**: Develop a robust automatic speech recognition (ASR) system customized to support the digitalization of Luxembourgish language resources, enhancing accessibility and preservation of the language.
- **Model Training and Optimization**: Use advanced machine learning techniques to train and optimize the ASR models, ensuring high accuracy and performance in recognizing Luxembourgish speech.
- **Technical Skills:** Python, Pytorch, HuggingFace, Wave2Vec, Whisper.
- **Try Lux-ASR system here:** `https://infolux.uni.lu/asr/`

MaLGa - Machine Learning Genoa Center, University of Genoa
Genoa, Italy

Enhancing Medical AI through Self-Supervised Learning — *June 2023 - July 2024*

- **Dataset Acquisition and Pre-processing**: Identify and collect a diverse range of medical datasets that are suitable for the intended tasks. Partition the datasets into labeled and unlabeled subsets, ensuring an appropriate balance to facilitate self-supervised learning.
- **Model Development and Training**: Select and design suitable self-supervised learning algorithms that are well-suited for medical AI tasks. Implement and train the self-supervised models using the unlabeled dataset, focusing on learning meaningful semantic features. Fine-tune the pre-trained self-supervised models on the labeled medical data to transfer the learned knowledge to the target task.
- **Technical Skills:** Python, Pytorch, LaTeX, Scripting, Git.

Leibniz-Zentrum Allgemeine Sprachwissenschaft (ZAS)
Berlin, Germany

Research assistant — *Jan 2020 - March 2022*

- **Script Development**: Wrote and modified PRAAT scripts to automate the analysis of phonetic data, enhancing the efficiency and accuracy of speech analysis.
- **Speech Analysis**: Conducted detailed analysis of whispered and normal speech using PRAAT (Phonetic and acoustic analysis toolkit), focusing on acoustic characteristics and differences in speech modalities.
- **Facial Analysis**: Worked with OpenFace for facial expression analysis, integrating it with speech data to explore multimodal aspects of communication.
- **Technical Skills:** RStudio (ggplot2), OpenCV, PRAAT.

SpeechTek lab, Fondazione Bruno Kessler company (FBK)
Trento, Italy

Thesis & Student assistant — *Aug 2019 - Sep 2020*

- **ASR System Enhancement**: Applied computational techniques to speech data aimed at improving ASR systems, specifically for detecting pronunciation errors in second language (L2) learners.
- **Research and Development**: Conducted research on speech processing algorithms and implemented improvements to enhance the accuracy and effectiveness of ASR systems in educational contexts.
- **Technical Skills:** Python, NumPy, Matplotlib, Pandas, Scikit-learn, Ubuntu Linux, Bash.

Academic & Training activities

GLORIA: GeneraLization with chain of thought fOR bIomedical Ai
Japan

Biomedical Linked Annotation Hackathon — *2025*

- **Team members**: Dimitra Anastasiou Luxembourg Institute of Science and Technology (LIST). & Davide Liga University of Luxembourg, Faculty of Science, Technology and Medicine (FSTM), Department of Computer Science
- **Tasks**: To develop a framework to benchmark LLM generalization in biomedical tasks, using CoT prompting for better interpretability in NER and diagnosis prediction. **&** To apply PEFT and LoRa techniques to enhance model efficiency, enabling cross-task evaluation of BioGPT and Llama3.2 within resource constraints.

WeSTEM+ (Women in Science, Technology, Engineering, and Mathematics) NGO
Luxembourg

Non-profit Organization — *2024*

- **Community Support and Education**: Already joined and contributed to WeSTEM+ by helping to organize and workshops as volunteer, aimed at supporting and promoting young girls, women, and underrepresented groups in STEM fields.

Organizer of TEICAI Colocated Workshop at EACL (European Chapter of the Association for Computational Linguistics):   *Malta, Malta*

Towards Ethical and Inclusive Conversational AI: Language Attitudes, Linguistic Diversity, and Language Rights (TEICAI) (funded by LITHME COST ACTION)   *March 2024*

- **Workshop Organization**: Led the organization of the TEICAI workshop at the EACL 2024 conference, focusing on promoting ethical and inclusive practices in conversational AI, particularly in relation to language attitudes, linguistic diversity, and language rights.
- **Agenda Development**: Coordinated the development of the workshop agenda, including the selection of speakers, topics, and panels that aligned with the workshop's goals of fostering discussions on inclusivity in AI.
- **Community Engagement**: Engaged with a diverse group of participants, including researchers, practitioners, and activists, to encourage collaborative efforts in addressing ethical challenges in AI related to language.
- **Social Media Promotion**: Managed the social media strategy for the workshop, creating content, engaging with the community, and promoting the event across various platforms to maximize attendance and participation.
- **Link of TEICAI website**: `https://sites.google.com/view/teicai2024`

Trainer @ COST ACTION GoodBrother   *Skopje, North Macedonia*

Training School   *June 2022*

- **Lecture Delivery**: Conducted a lecture titled "How to Apply Augmentation Techniques on Small Datasets: Neurodegenerative Diseases Datasets," providing participants with in-depth knowledge and practical skills for improving data quality in medical research.
- **Hands-on Training**: Led hands-on session where participants applied augmentation techniques to small datasets, enhancing their ability to work with limited data in the context of neurodegenerative disease research.
- **Technical Focus**: Covered various augmentation strategies, emphasizing their importance in training robust machine learning models with small datasets.
- **Link of training school**: `https://goodbrother.eu/training-schools/training-school-2022/`

Website manager   *Esch-sur-Alzette, Luxembourg*

AI in Action: BNAIC/BeneLearn 2021 conference   *2021*

- **Website Development and Management**: Managed and maintained the official website for the BNAIC/BeneLearn 2021 conference, ensuring that all content was up-to-date and that the site was functional and user-friendly.
- **Content Management**: Coordinated with conference organizers to upload schedules, speaker information, and other relevant materials, ensuring smooth communication with attendees.
- **Technical Skills:** Web development, Content management systems.
- **The link of website**: `https://bnaic2021.uni.lu/organisation/`

Education

PhD   *Luxembourg, Luxembourg*

Faculty of Science, Technology, and Medicine (FSTM)   *Jan 2021 - Current*

- Neurodegenerative Disease Analysis Project: Led the development of advanced machine learning models for the analysis and early detection of Alzheimer's disease, using handwriting tasks to improve diagnostic accuracy.
  Supervisors: Professor Christoph Schommer, Professor Luis Leiva

MSc   *Potsdam, Germany*

International Experimental and Clinical Linguistics (IECL)   *Apr 2017 - Jan 2021*

- Thesis: Automated Intelligibility and Phonological Analysis in Parkinson's Disease Patients
  Supervisors: Professor Manfred Stede, & Professor Elmar Nöth

MSc 1 & 2   *Netherlands & Italy*

Language and Communication Technologies (LCT)   *Sep 2017 - March 2020*

- Thesis: A deep learning approach to spoken proficiency scoring for non-native speakers", Grade
  Supervisors: Dr. Strapparava, & Dr. Caselli

Awards & Grants

2024	**3rd place in Competition on Digital medical devices**, Digital Medical Devices Summer School-Luxembourg/Barcelona	*Luxembourg/Spain*
2024	**Best Oral Presentation**, Ink of Insight: Data Augmentation for Dementia Screening through Deep Learning	*Japan*
2023	**Short-term scientific missions (STSM) grant**, Machine Learning Genoa Center (Malga Lab)	*Italy*
2023	**Hackthon on Improving Mispronunciation Detection and Diagnosis for Non-native Learners of the Arabic Language**, Speech and Language Technologies (SLTs)-@ Qatar Computing Research Institute (QCRI)	*Qatar-Doha*
July 2022	**Travel grant**, Summer School by COST ACTION Language in the Human-Machine, University of Porto	*Portugal*
2020	**Travel grant**, Lisbon machine learning school (LxMLS 2020)	*Portugal*
2020	**German Academic Exchange Service (DAAD) Grant**, Six months grant for Master Thesis	*Germany*
2019	**Travel grant**, Artificial intelligence summer school (PAISS)	*France*
2017-2019	**Erasmus Mundus Scholarship**, European Master's Program in Language & Communication Technologies	*Netherlands & Italy*

Skills

Programming	Python (Pandas, PyTorch, NumPy, Scikit-learn. etc.), R (ggplot2), MySQL.
Miscellaneous	Linux, Shell (Bash/Zsh), LaTeX(Overleaf/R Markdown), Git.
Soft Skills	Teamwork, Problem-solving, and Engaging presentation skills evidenced by positive feedback at international conferences.

Publications

CONFERENCE PROCEEDINGS

Predicting Alzheimer's Disease and Mild Cognitive Impairment with Off-line and On-line House Drawing Tests
Nina Hosseini-Kivanani, Elena Salobrar-García, Lorena Elvira-Hurtado, Inés López-Cuenca, Rosa Hoz, José M. Ramírez, Pedro Gil, Mario Salas, Christoph Schommer, Luis A. Leiva
Proc. eScience: Osaka, Japan, Accepted-2024

Mapping Sentiments: A Journey into Low-Resource Luxembourgish Analysis
Nina Hosseini-Kivanani, Julien Kuhn, Christoph Schommer
ECAI 2024 Workshop LUHME, 2024

User Requirement Analysis for a Real-Time NLP-Based Open Information Retrieval Meeting Assistant
Benoît Alcaraz, **Nina Hosseini-Kivanani**, Amro Najjar
Advances in Information Retrieval: 45th European Conference on Information Retrieval, ECIR 2023, Dublin, Ireland, Proceedings, Part I, 2023

ASRLux: Automatic speech recognition for the low-resource language Luxembourgish
Peter Gilles, Leopld Hillah, **Nina Hosseini-Kivanani**
Icphs2023, Prague, 2023

LUX-ASR: Building an ASR system for the Luxembourgish language
Peter Gilles, Nina Hosseini Kivanani, Léopold Edem Ayité Hillah
Proceedings-2022 IEEE Spoken Language Technology Workshop (SLT), 2023

Better Together: Combining Different Handwriting Input Sources Improves Dementia Screening
Nina Hosseini-Kivanani, Elena Salobrar-García, Lorena Elvira-Hurtado, Inés López-Cuenca, Rosa Hoz, José M. Ramírez, Pedro Gil, Mario Salas, Christoph Schommer, Luis A. Leiva
Proc. eScience: AI4Health, Limassol, Cyprus, 2023

Exploring the Use of Phonological Features for Parkinson's Disease Detection
Nina Hosseini-Kivanani, Camilo V´asquez-Correa, Elmar Nöth
Icphs2023, Prague, 2023

IRRMA: An Image Recommender Robot Meeting Assistant
Benoît Alcaraz, **Nina Hosseini-Kivanani**, Amro Najjar
Advances in Practical Applications of Agents, Multi-Agent Systems, and Complex Systems Simulation. The PAAMS Collection: 20th International Conference, PAAMS 2022, L'Aquila, Italy, Proceedings, 2022

XAI: Using Smart Photobooth for Explaining History of Art
Najjar* Amro, **Nina Hosseini-Kivanani***, Tchappi Haman Igor, Yazan Mualla, Egberdien Van Peijl, Daniel Karpati, Christoph Schommer
Proceedings of the 10th International Conference on Human-Agent Interaction, 2022

Experiments of ASR-based mispronunciation detection for children and adult English learners
Nina, Hosseini Kivanani, Roberto Gretter, Marco Matassoni, Giuseppe Daniele Falavigna
BNAIC/BeneLearn (2021) pp. 203–216. BnL, 2021

Automated cross-language intelligibility analysis of Parkinson's disease patients using speech recognition technologies
Nina, Hosseini-Kivanani, Vásquez-Correa Juan Camilo, Manfred Stede, Elmar Nöth
Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics: Student Research Workshop, Florence, Italy, 2019

Teaching & Supervision

Teaching

- Introduction to image processing (at Digital Learning Hub) (March 2024 & November 2024).
- Introduction to natural language processing (at Digital Learning Hub) (March 2024 & December 2024).
- Data Science for Humanities-Summer semester (BSc course) (2020-2023).
- Database Management 1-Winter semester (BSc course) (2023)

Mentoring

- Sven Kuffer (Winter semester (2023))
- Julien Kühn (Summer semester-2023).
- Daria Antropova (Winter & Summer semester (2022-2023).

Student Interns

- Omar Quardighi (Summer-2023).
- Vladimir Blizniukov (Summer-2022).