Curriculum Vitae

Personal Information

Name: Iuliia Thorbecke (Nigmatulina)

Date of Birth: *May 3d, 1990*

Mobile: 079 916 29 77

Email: iuliia.thorbecke@uzh.ch

GitHub: `https://github.com/yunigma`

Linkedin: `https://www.linkedin.com/in/yulia-nigmatulina-03386a1b/`

Education

2020–present **PhD candidate in Speech Technologies.** *Thesis: "Bridging ASR and NLU".* University of Zürich, Zürich; Idiap Research Institute, Martigny, Switzerland

- o FST;
- o ASR decoding;
- o Contextualisation and personalisation of ASR;
- o Streaming ASR.

2016–2020 **Master's studies in Computational Linguistics and Speech Technologies.** *Thesis: "Acoustic modelling for Swiss German ASR".* University of Zürich, Zürich, Switzerland

- o Deep Learning;
- o Machine Translation (SMT; NMT);
- o Programmiertechniken in Computerlinguistik (Python; JavaScript; 3 semesters)
- o Quantitative Methode.

2013–2016 **Postgraduate studies in Phonetics.** *Thesis: "Patterns of Phonetic Modifications in Different Types of Russian Speech".* St. Petersburg State University, St. Petersburg, Russia

2007–2013 **Master's degree in Psycholinguistics and General Linguistics (cum laude).** *Thesis: "Sound Contractions in Russian Spontaneous and Prepared Speech" (focus on speech perception algorithms).* St. Petersburg State University, St. Petersburg, Russia

2011–2012 **French Right and Sociology (in French).** Collège Universitaire Français de Saint-Pétersbourg, St. Petersburg, Russia

Experience

2019–present **Research Assistant (full-time).** Idiap Research Institute, Martigny, Switzerland

- o Speech recognition for air traffic communication (in collaboration with The German Aerospace Center (DLR)).
- o ASR pipeline for streaming decoding.
- o Speech recognition for call centers (in collaboration with the Uniphore company).
- o Improving rare/special words recognition and integrating OOV words without system retraining.

2018–2020 **Tutor (Institute of Computational Linguistics).** University of Zürich, Zürich, Switzerland

- o Language Technology and Web Applications (HS18);
- o Speech Science and Speech Signal Processing (FS19);

- Machine Learning in Computational Linguistics (HS19);
- Text Analytics in the Digital Humanities (FS20).

2018–2018 **Intern.** SpinningBytes AG (`http://www.spinningbytes.com/`). Computer Software, Winterthur, Switzerland.

- Natural Language Processing;
- Machine Learning;
- Sentiment Analysis (working with twitter data);
- Elasticsearch.

2017–2020 **Student Assistant (Institute of Computational Linguistics).** University of Zürich, Zürich, Switzerland

- stance detection project;
- speech segmentation; phonetic transcription; speech experiments;
- training ASR systems; iVector extraction.

2011–2016 **Engineer.** Speech Modeling Laboratory (`http://narusco.ru/`). St. Petersburg State University, St. Petersburg, Russia.

- creation of a spontaneous speech corpus;
- phonetic transcription and speech experiments;
- studying of intonation contour of spontaneous speech.

2014–2016 **Lecturer** (*lectures with presentations; made tasks for student home practice; prepared tests; administered examinations).* St. Petersburg State University of Aerospace Instrumentation (the Faculty of Art), St. Petersburg, Russia

- Introduction in general Phonetics.
- Methods of speech analysis.

Technical skills

Python (NLTK, sklearn, gensim, spacy etc.); bash scripting

Deep Learning experience: PyTorch, TensorFlow, DyNet

Speech Recognition (Kaldi, K2/Icefall/Lhotse); Speech processing (PRAAT, Audacity)

LLM (SLAM-LLM)

SQL and relational DBMS, and basic NoSQL knowledge (ElasticSearch)

Basic web development (HTML, CSS, Javascript)

Basic statistic analysis in R

Achievements

2012 **Scholarship** for "Excellent Students of St. Petersburg State University"

2013 **Diploma and Second Place Award** *for "Best Student Researcher in Phonetics, Speech, Speech & Language Technologies".* (Speech & Multimodal Interfaces Laboratory, St. Petersburg Institute for Informatics and Automation of Russian Academia of Science)

Research projects

Recognition of ambiguous fragments of speech signal (evidence from spontaneous Russian). St. Petersburg State University, Russia.

Role of pitch in the preservation of unity of "broken" discourse units in spontaneous speech . St. Petersburg State University, Russia.

Second language perceptual experience and first language sound identification. Purdue University, Purdue, USA.

Languages

Russian - Mother tongue

English - full proficiency

German - fluent

French - fluent

Interests

- **Drama** (former member of a student theatre company)
- **Art, Drawing, Painting** (Painting course at SPb State Museum of Modern Art)
- **Volunteer** (Sustainability Week, Zürich 2020)

Selected presentations and publications

Nigmatulina, I., Madikeri S., Villatoro-Tello E., Motlicek P., Zuluaga-Gomez J., Pandia K., Ganapathiraju A. Implementing contextual biasing in GPU decoder for online ASR. Proc. Interspeech 2023.

Nigmatulina, I., Zuluaga-Gomez, J., Prasad, A., Sarfjoo, S. S., & Motlicek, P. A two-step approach to leverage contextual data: speech recognition in air-traffic communications. In ICASSP 2022-2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) (pp. 6282-6286). IEEE.

Zuluaga-Gomez, J., **Nigmatulina, I**., Prasad, A., Motlicek, P., Veselý, K., Kocour, M., & Szöke, I. (2021). Contextual semi-supervised learning: An approach to leverage air-surveillance and untranscribed ATC data in ASR systems. Proc. Interspeech 2021.

Nigmatulina, I., Braun, R., Zuluaga-Gomez, J., & Motlicek, P. (2021). Improving call-sign recognition with air-surveillance data in air-traffic communication. arXiv preprint arXiv:2108.12156.

Kocour, M., Veselý, K., Szöke, I., Kesiraju, S., Zuluaga-Gomez, J., Blatt, A., Prasad, A., **Nigmatulina, I**., Motlíček, P., Klakow, D. and Tart, A., 2021. Automatic processing pipeline for collecting and annotating air-traffic voice communication data. Engineering Proceedings, 13(1), p.8.

Nigmatulina, I., Kew, T., and Samardžić, T. ASR for Non-standardised Languages with Dialectal Variation: the case of Swiss German. Accepted for presentation and publication in VarDial workshop, Dec. 2020.

Nigmatulina, I., Kew, T., and Samardžić, T. Swiss German speech-to-text with Kaldi. SwissText, 2020 (presentation).

Kew, T., **Nigmatulina, I**., Nagele, L., and Samardžić, T. UZH TILT: A Kaldi recipe for Swiss German Speech to Standard German Text. SwissText conference, 2020.

Dmitrieva, O., Conklin, J., **Nigmatulina, Y**. Transferring cue-weighting from second language into first language: Group trends and individual differences. The Journal of Acoustical Society of America, 140(4), 2016. Pp. 3333-3334.

Nigmatulina, I., Riechakajnen, E. Pauses and pitch contours in spontaneous speech processing: Evidence from Russian. Presented at the "Tone and Intonation in Europe" (TIE 2016). University of Kent, Canterbury, the UK 2016 (presentation).

Nigmatulina Y., Rajeva O., Riechakajnen E., Slepokurova N., Vencov A. How to study spoken word recognition: evidence from Russian // Slavic Languages in the Black Box. Tuebinger Beitraege zur Linguistik. Tuebingen: narr-Verlag, 2016. Pp. 175-190.

Nigmatulina Y. Word-External Reduction in Spontaneous Russian // Speech and Computer. Volume 9319 of the series Lecture Notes in Computer Science. Athens 2015. Pp. 495-503.

Nigmatulina, I. Phonetic information relevant for spoken word recognition // International conference 'Phonetics and phonology in Europe' (PaPE 2015). University of Cambridge, Cambridge, the UK. 2015 (presentation).

Nigmatulina Y. Sound contraction in Russian spontaneous speech and its implications for spoken word recognition // New Perspectives on Speech in Action. Proceedings of the 2nd SJUSK Conference on Contemporary Speech Habits. Copenhagen 2013. Pp. 127-140.

Nigmatulina Y. Fading of word boundaries in spontaneous and read-aloud speech: evidence from Russian. St.Petersburg State University Journal, St.Petersburg, 2017. Pp. 76-88.