Ryuichi Yamamoto

Voice Team
LINE Corporation
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Last updated: February, 2022
Publications: Google Scholar
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EDUCATION

2011 – 2013 **M.Eng**, Graduate School of Engineering
Nagoya Institute of Technology, Nagoya, Japan
Superviser: Prof. Tadashi Kitamura

2007 – 2011 **B.Eng**, Department of Computer Science
Nagoya Institute of Technology, Nagoya, Japan
Superviser: Prof. Tadashi Kitamura

PROFESSIONAL EXPERIENCE

2021 – present **Senior Research Scientist**
Voice Team
LINE Corporation, Tokyo, Japan

2018 – 2020 **Research Engineer**
Voice Team
LINE Corporation, Tokyo, Japan

2018 – 2019 **Research Engineer**
Clova Voice
NAVER Corporation, Seongnam, Gyeonggi-do, Korea

2013 – 2017 **Software Engineer**
Computer Vision Team
teamLab Inc., Tokyo, Japan

RESEARCH AREAS

- Statistical Speech Synthesis, Machine Learning, Voice Conversion
- Music Signal Processsing, Music Information Retrieval

PROGRAMMING SKILS

- Experienced in Linux/Windows programming based on C/C++, Python, Bash, Emacs, Git.
- Experienced in speech processsing toolkit (SPTK, HTK, HTS, Merlin, ESPnet)
- Experienced in deep learning framework (PyTorch, Keras)

LANGUAGES

Japanese   Native

English   Intermediate

MEMBERSHIPS

- The Institute of Electrical and Electronics Engineers, Inc. (IEEE), Member
- The Acoustical Society of Japan (ASJ), Member

AWARDS

2021   IEEE Signal Processing Society (SPS) Japan Young Author Best Paper Award

2013   Best Presentation Award in the Acoustic Society of Japan (ASJ)

2012   Best Presentation Award in the Acoustic Society of Japan (ASJ), Tokai

PUBLICATIONS

BOOKS

2021   **Ryuichi Yamamoto**, Shinnosuke Takamichi, "Text-to-speech with Python," Impress.
- Website: book.impress.co.jp/books/1120101073
- Code: r9y9/ttslearn

JOURNALS

2013   Eita Nakamura, Haruto Takeda, **Ryuichi Yamamoto**, Yasuyuki Saito, Shinji Sako, Shigeki Sagayama, "Score Following Handling Performances with Arbitrary Repeats and Skips and Automatic Accompaniment," *Journal of Information Processing Society of Japan*, Vol. 54, No. 4, pp. 1338-1349, 2013.

CONFERENCE PROCEEDINGS (PEER-REVIEWED)

2021   Min-Jae Hwang, **Ryuichi Yamamoto**, Eunwoo Song, Jae-Min Kim, "High-Fidelity Parallel WaveGAN with Multi-Band Harmonic-Plus-Noise Model," *Proc. Interspeech*, pp. 2227–2231, 2021.
- Website: min-jae.github.io/interspeech2021/

Kosuke Futamata, Byeongseon Park, **Ryuichi Yamamoto**, Kentaro Tachibana, "Phrase Break Prediction with Bidirectional Encoder Representations in Japanese Text-to-Speech Synthesis," *Proc. Interspeech*, pp. 3126–3130, 2021.
- Website: matasuke.github.io/demos/pbp_bert

Ryuichi Yamamoto, Eunwoo Song, Min-Jae Hwang, Jae-Min Kim "Parallel Waveform Synthesis Based on Generative Adversarial Networks with Voicing-Aware Conditional Discriminators," *Proc. International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 6039–6043, 2021.
- Website: r9y9.github.io/demos/projects/icassp2021/

Min-Jae Hwang, **Ryuichi Yamamoto**, Eunwoo Song, Jae-Min Kim, "TTS-by-TTS: TTS-Driven Data Augmentation for Fast and High-Quality Speech Synthesis," *Proc. International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 6598–6602, 2021.
- Website: min-jae.github.io/icassp2021/

Eunwoo Song, **Ryuichi Yamamoto**, Min-Jae Hwang, Jin-Seob Kim, Ohsung Kwon, Jae-Min Kim, "Improved Parallel Wavegan Vocoder with Perceptually Weighted Spectrogram Loss," *Proc. Spoken Language Technology Workshop (SLT)*, pp. 470–476, 2021.
- Website: sewplay.github.io/demos/wavegan-pwsl/

2020   Eunwoo Song, Min-Jae Hwang, **Ryuichi Yamamoto**, Jin-Seob Kim, Ohsung Kwon, Jae-Min Kim, "Neural Text-to-Speech with a Modeling-by-Generation Excitation Vocoder," *Proc. Interspeech*, pp. 3570–3574, 2020.
- Website: sewplay.github.io/demos/mbg_excitnet/

Katsuki Inoue, Sunao Hara, Masanobu Abe, Tomoki Hayashi, **Ryuichi Yamamoto**, Shinji Watanabe, "Semi-Supervised Speaker Adaptation for End-to-End Speech Synthesis with Pretrained Models," *Proc. International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 7634–7638 2020.

Min-Jae Hwang, Eunwoo Song, **Ryuichi Yamamoto**, Frank Soong, Hong-Goo Kang, "Improving LPCNET-Based Text-to-Speech with Linear Prediction-Structured Mixture Density Network," *Proc. International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 7219–7223, 2020.

Ryuichi Yamamoto, Eunwoo Song, Jae-Min Kim, "Parallel WaveGAN: A Fast Waveform Generation Model Based on Generative Adversarial Networks with Multi-Resolution Spectrogram," *Proc. International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 6199–6203, 2020.
- Website: r9y9.github.io/demos/projects/icassp2020/

Tomoki Hayashi, **Ryuichi Yamamoto**, Katsuki Inoue, Takenori Yoshimura, Shinji Watanabe, Tomoki Toda, Kazuya Takeda, Yu Zhang, Xu Tan, "ESPnet-TTS: Unified, Reproducible, and Integratable Open Source End-to-End Text-to-Speech Toolkit," *Proc. International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 7654–7658, 2020.
- Website: espnet.github.io/icassp2020-tts/

2019   **Ryuichi Yamamoto**, Eunwoo Song, Jae-Min Kim, "Probability Density Distillation with Generative Adversarial Networks for High-Quality Parallel Waveform Generation," *Proc. Interspeech*, pp. 699–703, 2019.
- Website: r9y9.github.io/demos/projects/interspeech2019/

Shigeki Karita, Nanxin Chen, Tomoki Hayashi, Takaaki Hori, Hirofumi Inaguma, Ziyan Jiang, Masao Someki, Nelson Enrique Yalta Soplin, **Ryuichi Yamamoto**, Xiaofei Wang, Shinji Watanabe, Takenori Yoshimura, Wangyou Zhang, "A Comparative Study on Transformer vs RNN in Speech Applications," *Proc. Automatic Speech Recognition and Understanding Workshop (ASRU)*, pp. 449–456, 2019.

2014   Shinji Sako, **Ryuichi Yamamoto**, Tadashi Kitamura, "Ryry: A Real-Time Score-Following Automatic Accompaniment Playback System Capable of Real Performances with Errors, Repeats and Jumps," *Proc. International Conference on Active Media Technology (ICAMT)*, pp. 134–145, 2014.

2013   **Ryuichi Yamamoto**, Shinji Sako, Tadashi Kitamura, "Robust On-line Algorithm For Real-time Audio-to-score Alignment Based on A Delayed Decision and Anticipation Framework," *Proc. International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 191–195, 2013.

   Ryuichi Yamamoto, Shinji Sako, Tadashi Kitamura, "Accurate and Low Computational Audio-to-score Alignment Using Segmental CRF with An Explicit Continuous Tempo Model," *Proc. of Communications and Signal Processing (NCSP)*, pp. 345–348, 2013.

CONFERENCE PROCEEDINGS (NON PEER-REVIEWED)

2021   Ryo Terashima, **Ryuichi Yamamoto**, Kentaro Tachibana, "An Investigation of Data Augmentation Using CycleGAN Voice Conversion for Text-to-Speech Synthesis," *The Acoustic Society of Japan (ASJ)*, pp. xxx–xxx, 2021 (in Japanese).
   - Website: ryojerky.github.io/demo/

2013   **Ryuichi Yamamoto**, Shinji Sako, Tadashi Kitamura, "Ryry: Automatic Accompaniment System Capable of Polyphonic Instruments," *Proc. Interaction*, 2013 (in Japanese).

   Ryuichi Yamamoto, Shinji Sako, Tadashi Kitamura, "Score Following Based on a Combined Model of Score Position and Tempo and Application to Audio-based Automatic Accompaniment," *The Acoustic Society of Japan (ASJ)*, pp. 1065–1066, 2013 (in Japanese).

2012   **Ryuichi Yamamoto**, Shinji Sako, Tadashi Kitamura, "Real-time Audio to Score Alignment Using Segmental Conditional Random Fields and Linear Dynamical System," *Proc of The Music Information Retrieval Evaluation eXchange (MIREX)*, 2012.

   Ryuichi Yamamoto, Shinji Sako, Tadashi Kitamura, "Audio to Score Alignment Using Semi-Markov Conditional Random Fields," *The Acoustic Society of Japan (ASJ)*, pp. 935–936, 2012 (in Japanese).

   Ryuichi Yamamoto, Eita Nakamura, Yasuyuki Saito, Shinji Sako, Shigeki Sagayama, "Eurydice: Automatic Accompaniment System with Jumping Capability," *Proc. Information Processing Society of Japan (IPSJ)*, MUS-96(18), pp. 1–10, 2012 (in Japanese).

   Ryuichi Yamamoto, Shinji Sako, Tadashi Kitamura, "Real-time Audio to Score Alignment using Hidden Semi-Markov Model and Linear Dynamical System," *Proc. Information Processing Society of Japan (IPSJ)*, MUS-96(13), pp. 1–6, 2012 (in Japanese).

   Eita Nakamura, **Ryuichi Yamamoto**, Shinji Sako, Yasuyuki Saito, Shigeki Sagayama, "Modeling ornaments in polyphonic MIDI score following and its application to automatic accompaniment", *Proc. The Acoustic Society of Japan (ASJ)*, pp. 929–930, 2012 (in Japanese).

   Eita Nakamura, **Ryuichi Yamamoto**, Shinji Sako, Yasuyuki Saito, Shigeki Sagayama, "Modeling Performance Indeterminacies for Polyphonic Midi Score Following and Its Application to Automatic Accompaniment", *Proc. Information Processing Society of Japan (IPSJ)*, MUS-96(14), pp. 1–6, 2012 (in Japanese).

2011   **Ryuichi Yamamoto**, Shinji Sako, Tadashi Kitamura, "Cooperative Automatic Accompaniment System Using Predictive Models of Expression in Music Performance Based on CRFs," *Proc. Information Processing Society of Japan (IPSJ)*, MUS-91(11), pp. 1–6, 2011 (in Japanese).

SELECTED SOFTWARE

LIBRARIES

2021 – present   **ttslearn**
Library for the book "Text-to-speech with Python"
- Role: Creator and core developer
- Code: r9y9/ttslearn
- Website: r9y9.github.io/ttslearn/

2020 – present   **nnsvs**
Neural network-based singing voice synthesis library for research
- Role: Creator and core developer
- Code: r9y9/nnsvs

2017 – present   **nnmnkwii**
Library to build speech synthesis systems designed for easy and fast prototyping
- Role: Creator and core developer
- Code: r9y9/nnmnkwii
- Website: r9y9.github.io/nnmnkwii/latest/

2015 – present   **pysptk**
A python wrapper for Speech Signal Processing Toolkit (SPTK).
- Role: Creator and core developer
- Code: r9y9/pysptk
- Website: pysptk.readthedocs.io/

2015 – present   **pyworld**
A Python wrapper for the high-quality vocoder "World"
- Role: Core contributor and maintainer
- Code: JeremyCCHsu/Python-Wrapper-for-World-Vocoder

2014 – 2020   **WORLD.jl**
A lightweight Julia wrapper for WORLD - a high-quality speech analysis, modification and synthesis system
- Role: Creator and core developer
- Code: r9y9/WORLD.jl
- Website: r9y9.github.io/world.jl/latest/

2014 – 2017   **MelGeneralizedCepstrums.jl**
Mel-Generalized Cepstrum analysis
- Role: Creator and core developer
- Code: r9y9/MelGeneralizedCepstrums.jl

2015 – 2019 **librosa**
Python library for audio and music analysis.
- Role: Contributor
- Code: librosa/librosa
- Website: librosa.org/

RESEARCH PROJECTS

2019 – present **ESPnet**
End-to-End Speech Processing Toolkit
- Role: Discussions and reviews for text-to-speech features
- Code: espnet/espnet
- Website: espnet.github.io/espnet/

2017 – 2021 **wavenet_vocoder**
WaveNet vocoder: neural network based waveform generation models
- Role: Creator and core developer
- Code: r9y9/wavenet_vocoder
- Website: r9y9.github.io/wavenet_vocoder/

2017 – 2020 **deepvoice3_pytorch**
PyTorch implementation of convolutional neural networks-based text-to-speech synthesis models
- Role: Creator and core developer
- Code: r9y9/deepvoice3_pytorch
- Website: r9y9.github.io/deepvoice3_pytorch/

2017 – 2020 **gantts**
PyTorch implementation of GAN-based text-to-speech synthesis and voice conversion
- Role: Creator and core developer
- Code: r9y9/gantts

2017 – 2019 **tacotron_pytorch**
PyTorch implementation of Tacotron speech synthesis model
- Role: Creator and core developer
- Code: r9y9/tacotron_pytorch

2014 – 2016 **VoiceConversion.jl**
Statistical Voice Conversion in Julia
- Role: Creator and core developer
- Code: r9y9/VoiceConversion.jl

2014 – 2016 **RobustPCA.jl**
Robust Principal Component Analysis in Julia
- Role: Creator and core developer
- Code: r9y9/RobustPCA.jl

SUPERVISOR FOR STUDENTS

2021.09 – present   Reo Yoneyama (Nagoya University)

2021.03 – 2021.09   Takaaki Saeki (The University of Tokyo)

PRESENTATIONS

2022   **Ryuichi Yamamoto**, "Research and development for TTS in industry," Nagoya Institute of Technology, Pattern Recognition III, Jan 2022, Online.

2021   Tomohiro Tanaka, **Ryuichi Yamamoto**, "Report on Participation in Interspeech2021," SIG Technical Reports, Dec 2021, Online.

2020   **Ryuichi Yamamoto**, "Parallel WaveGAN: Fast and High-Quality GPU Text-to-Speech," Conference on Computer Science for Enterprise (CCSE), Dec 2020, Online.

       Ryuichi Yamamoto, "Parallel WaveGAN: Fast and High-Quality GPU Text-to-Speech," Main Sesson in LINE DEVELOPER DAY, Nov 2020, Online.
- Recording: ▶ youtube.com/watch?v=knzT7M6qsl0

       Togami Masahito, Yusuke Kida, **Ryuichi Yamamoto**, Keisuke Imoto, "Current progress on speech technologies and its future prospects," Panel Discussion in LINE DEVELOPER DAY, Nov 2020, Online.
- Recording: ▶ youtube.com/watch?v=iSPBCot6n7g

       Tomoki Hayashi, **Ryuichi Yamamoto**, Katsuki Inoue, Takenori Yoshimura, Kazuya Takemura, Tomoki Toda, Shinji Watanabe, "ESPnet-TTS: A toolkit to accelerate research on end-to-end speech synthesis.," Special session of The Acoustic Society of Japan (ASJ), Mar 2020, Online.
- **Invited talk**
- Website: kan-bayashi.github.io/asj-espnet2-tutorial/

2018   **Ryuichi Yamamoto**, "WaveNet: A Generative Model for Raw Audio: What I Learned from Developing An Open-Source Implementation," Invited Talk in National Institute of Information and Communications Technology (NICT), Feb 2018, Kyoto.
- **Invited talk**

       Ryuichi Yamamoto, "An Attempt to Reproduce WaveNet-based Text-to-Speech Synthesis," MACHINE LEARNING Meetup KANSAI, Jun 2018, Kyoto.

2016   **Ryuichi Yamamoto**, "The Julia C++ Interface," JuliaTokyo #6, Sep 2016, Tokyo.

2015   **Ryuichi Yamamoto**, "Speech Signal Processing in Julia," JuliaTokyo #3, Apr 2015, Tokyo.

2014   **Ryuichi Yamamoto**, "BinDeps.jl," JuliaTokyo #2, Sep 2014, Tokyo.