

# Dr. Frederik Bous

## Résumé

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### Research interest

AI for voice, music, and sound: Controllable and interpretable generative models, self-supervised representation learning, multi-modal representation learning. Open to new challenges related to artistic media.

### Experience

**Supertone Inc., Korea** 2024 – today

#### Research Scientist

- Research related to Supertone's voice technology:
  - Improve quality and controllability on voice backbone model
  - Analysis and transformation of room acoustics, pitch, subharmonics, breathiness and intensity.
  - Self-supervised- and representation learning related to TTS
- Application development: Develop and maintain voice editing tool using Supertone's voice technology

**IRCAM, France**

2018 – 2024

#### Post-doc, Doctoral researcher, Intern

- Research on deep learning for voice
  - 6 peer reviewed publications including 5 as first author and 2 journal articles.
  - Topics: Neural vocoding and representation, self-supervised learning, voice attribute transformation.
- Technical support for film, music and art: Bespoke implementations of voice transformation.
- Application development: Implement research results into voice editing and live transformation app.

**Siemens AG, Germany**

2015

#### Intern

### Education

**Doctor of Philosophy (PhD)** Sorbonne Université, France 2023

**Master of Science (MSc)** (Computational Engineering) TU Darmstadt, Germany 2019

**Bachelor of Science (BSc)** (Electrical Engineering) TU Darmstadt, Germany 2014

### Skills

**Deep learning** Self-supervised learning, generative AI, representation learning, AI for speech and audio

**Signal processing** Strong DSP background, DSP pre- and post-processing for AI, DDSP

**Voice and language** Phonetics, source-filter model, physical voice production, voice acoustics

**Music** Singing, classical composition techniques, live coding (Tidal Cycles), Piano

**Programming languages** Python (torch, tensorflow), Haskell, Java, Kotlin, Unix Shell (bash, zsh, fish)

**App development** Android, GTK, VST

**Languages** German (native), English (C2), French (B2), Polish (B1), Chinese (A2), Korean (basic)

### Other

**Full PhD scholarship** EDITE de Paris (ED130) 2019 – 2022

**Full study scholarship** Studienstiftung des deutschen Volkes (SdV) 2015 – 2019

**Additional credits** (Maths & Music) TU Darmstadt, Germany 2015 – 2018

**Study exchange** Tongji University, Shanghai, China 2014 – 2015

**Deutschlandstipendium** TU Darmstadt, Inro Elektrotechnik, Siemens 2013 – 2014

**Teaching assistant** (Stochastic signals and systems) TU Darmstadt, Germany 2014

**Study exchange** AC Davis High School, Yakima, WA, USA 2009 – 2010