

# Curriculum Vitae

## CONTACT

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Prof. Dr.-Ing. Sebastian Jiro Schlecht

Aalto Acoustics Lab & Aalto Media Lab

Otakaari 5E

Espoo, Finland

[www.sebastianjiroschlecht.com](http://www.sebastianjiroschlecht.com)



## ACADEMIC POSITIONS

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- 09/2019 – **Professor of Practice**  
Sound in Virtual Reality  
Aalto University, Helsinki, Finland
- 08/2010 – **Research & Development Consultant**  
Department Multimedia Realtime Systems  
Fraunhofer Institute for Integrated Circuits, Erlangen, Germany
- 03/2019 – 08/2019 **Postdoctoral Researcher**  
Semantic Audio Processing  
Friedrich-Alexander University Erlangen-Nürnberg, Germany
- 03/2018 & 03/2019 **Visiting Researcher**  
Acoustics Lab  
Aalto University, Helsinki, Finland
- 03/2018 – 02/2019 **Postdoctoral Researcher**  
Perception-Based Spatial Audio Signal Processing  
Friedrich-Alexander University Erlangen-Nürnberg, Germany
- 01/2012 – 09/2017 **Research Assistant**  
Perception-Based Spatial Audio Signal Processing  
Friedrich-Alexander University Erlangen-Nürnberg, Germany
- 04/2007 – 06/2010 **Student Assistant**  
Theoretical Computer Science  
University of Trier, Germany

## EDUCATION

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- 01/2012 – 09/2017 **PhD in Spatial Audio Signal Processing**  
*Feedback Delay Networks in Artificial Reverberation and Reverberation Enhancement*  
Friedrich-Alexander University Erlangen-Nürnberg  
Supervisor: Prof. Dr. Emanuel Habets  
Graduated with distinction
- 10/2014 – 09/2016 **Music Theory & Ear Training**  
Private studies with Prof. Christoph Göbel  
University of Music and Theatre, Leipzig, Germany
- 09/2010 – 08/2011 **MSc in Digital Music Processing**  
Queen Mary, University of London, England  
Scholarship by the German Academic Exchange Service  
Graduated with distinction
- 07/2010 **Summer Workshops on Perceptual Audio Coding and Electronic Music Composition**  
Centre for Computer Research in Music and Acoustics  
Stanford University, California, USA  
Funded by the German Academic Exchange Service
- 04/2006 – 07/2010 **Diplom (Combined BSc / MSc) in Applied Mathematics**  
University of Trier, Germany  
Graduated with distinction
- 01/2009 – 04/2009 **3-month Internship in Japan**  
Bosch Corporation, Yokohama, Japan  
DA&CAPS Engineering Departement  
Supported by the German Academic Exchange Service
- 04/2006 – 07/2007 **Vordiplom (BSc) in Computer Science**  
University of Trier, Germany
- 09/2005 – 03/2006 **Studies in Mathematics**  
University of the Saarland, Saarbrücken, Germany
- 07/2005 **Abitur (General qualification for university entrance)**  
Theodor-Heuss-Gymnasium, Nördlingen, Germany  
Grade 1.3 (marks from 1.0 best to 4.0)
- 01/2003 – 07/2003 **School Exchange to Japan**  
Meito High School, Nagoya, Japan

## SCHOLARSHIPS

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- 09/2010 – 08/2011     **German Academic Exchange Service (DAAD)**  
1-year M.Sc. scholarship  
Queen Mary, University of London, England
- 07/2010                 **German Academic Exchange Service (DAAD)**  
4-week scholarship for summer workshop  
Stanford University, CA, USA
- 01/2009 – 04/2009     **German Academic Exchange Service (DAAD)**  
Supporting scholarship for 3-month internship  
Bosch Corporation, Yokohama, Japan

## AWARDS

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- 08/2018                 **Best Peer-Reviewed Paper**  
*Audio quality evaluation in virtual reality: Multiple stimulus ranking with behavior tracking*  
by Olli Rummukainen, Thomas Robotham, Sebastian J. Schlecht, Axel Plinge, Jürgen Herre, Emanuël A. P. Habets  
2018 AES International Conference on Audio for Virtual and Augmented Reality in Redmond, WA, USA
- 09/2018                 **Best Paper**  
*Optimized velvet-noise decorrelator*  
by Sebastian J. Schlecht, Benoit Alary, Vesa Välimäki, Emanuël A. P. Habets  
2018 International Conference on Digital Audio Effects (DAFx) in Aveiro, Portugal

## INVITED TALKS

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- 02/2019                 **Measuring Intonation via Dissonance in Polyphonic Choral Singing**  
Computational Methods for Melody and Voice Processing in Music Recordings, Dagstuhl Seminar, Germany
- 01/2019                 **Artificial Reverberation**  
Ableton AG, Berlin, Germany
- 03/2018                 **Feedback Delay Networks - Inside the Matrix**  
Acoustics Lab, Aalto University, Espoo, Finland

10/2015                    **Immersive Audio Signal Processing and Effects**  
Convention Audio Engineering Society (AES), New York, NY,  
USA

## TEACHING

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10/2018 – 2020            **Thesis Advisor**  
Benoit Alary, PhD student at Acoustics Lab under supervision  
Prof. Vesa Välimäki  
Aalto University, Espoo, Finland

03/2018                    **Virtual Acoustics**  
Guest Lecturer in a lecture series of Prof. Frank Wefers  
Friedrich-Alexander University Erlangen-Nürnberg, Germany

2015 & 2018              **Seminar on Audio Processing**  
Supervision of seminar paper  
Friedrich-Alexander University Erlangen-Nürnberg, Germany

09/2007 – 07/2010      **Student Assistant**  
Assistant in theoretical computer science course  
University of Trier, Germany

## MUSIC & DESIGN POSITIONS

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09/2018 – 10/2018      **Get Well Soon**  
Violin, The Horror European Tour (2018)

08/2014 – 12/2017      **Mighty Oaks**  
Violin & Keys, European Tours: Higher Place (2017), Dreamers  
(2017), Golden Road (2014) and Festivals

08/2013 – 05/2016      **LötKrft Design Collective**  
Founder, Electronics & Interaction Design

11/2011 – 07/2017      **David Lemaitre**  
Violin & Electronics, European Tours: Aquatics (2011), Valedic-  
tion (2012), Latitude (2013) and Festivals, La Sud South America  
Tour (2016)

09/2010 – 10/2011      **Sullum Voe**  
Violin, Selected concerts: Whitechapel Gallery (London), Centre  
Pompidou (Paris), Gareth Pugh's Pitti Debut (Florence)

07/2006 – 08/2010      **The Shanes**  
Violin, Germany Tours: Polka over Serbja (2007), Squandering  
Youth (2009)

01/2007 – 10/2008     **Paul Juon Piano Trio**  
Violin  
2nd Prize Charles Hennen Concours, Heerlen, Netherland  
3rd Prize "Jugend musiziert" national final round

04/1998 – 09/2008     **Swabian Youth Symphony Orchestra**  
Concertmaster, Principal 2nd Violin, Principal Viola

## ARTISTIC & DESIGN WORKS

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2010 – 2017           **Studio Recordings (Selection)**  
Like Lovers, Everything All The Time Forever, 2019  
Charlotte Brandi, The Magician, 2018  
Mighty Oaks, Storm, 2017  
Fern, Fern, 2017  
Der Weg einer Freiheit, Stellar, 2015; Finisterre, 2017  
Fayzen, Gerne allein, 2017  
Laith Al-Deen, Bleib unterwegs, 2016  
A Tale of Golden Keys, Everything Went Down As Planned, 2016  
Abby, Welcome Home, 2011; Friends&Enemies, 2013; Hexagon,  
2015  
Berge, Vor uns die Sintflut, 2015  
Nico Suave feat. X. Naidoo, Unvergesslich, 2014  
Ray Wilson (Genesis), LiveTracks, 2014  
David Lemaitre, Latitude, 2013  
Max Prosa, Rangoon, 2013  
Marla Blumenblatt, Immer die Boys, 2013  
We invented Paris, We Invented Paris, 2011

2013 – 2016           **Light & Interaction design** with LötKraft  
Like Lovers, Lights & Interaction, 2016  
We Invented Paris, Lights, 2015  
David Lemaitre, Lights & Instruments, 2013

08/2011               **Gonda** by Ursula Mayer  
Original Film Score, Composition & Performance, 2011

01/2011               **Pitti Debut** by Gareth Pugh  
Video & Live Fashion Show, Composition & Performance, 2011

## PROGRAMMING

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- Matlab (Expert)
- C++, Audio Plugin Development (Advanced)
- PureData/MaxMSP, Ableton Live (Advanced)
- Arduino,  $\LaTeX$ (Intermediate)

## CONFERENCES

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01/2019	Computational Methods for Melody and Voice Processing in Music Recordings Dagstuhl Seminar, Germany
09/2018	Digital Audio Effects (DAFx) Aveiro, Portugal, Poster
08/2018	Conference Audio Engineering Society (AES) Tokyo, Japan, Talk
09/2017	Digital Audio Effects (DAFx) Edinburgh, UK, Poster
05/2017	Quality of Multimedia Experience (QoMEX) Erfurt, Germany, Poster
03/2017	Conference Audio Engineering Society (AES) Erlangen, Germany, Participant
01/2017	Convention Audio Engineering Society (AES) Berlin, Germany, Participant
10/2016	Ableton Loop Berlin, Germany, Participant
11/2015	Convention Audio Engineering Society (AES) New York, USA, Invited Workshop
09/2015	Conference Audio Engineering Society (AES) Montreal, Canada, Talk
07/2015	Convention Audio Engineering Society (AES) Warsaw, Poland, Talk
10/2012	Convention IEEEI, Eilat Israel, Talk
09/2012	Workshop on Acoustic Signal Enhancement (IWAENC) Aachen, Germany, Poster

## Journals

- [1] B. Alary, A. Politis, S. J. Schlecht, and V. Välimäki, “Directional feedback delay network,” *Journal of the Audio Engineering Society*, 2019.
- [2] S. J. Schlecht and E. A. P. Habets, “Modal decomposition of feedback delay networks,” *IEEE Transaction on Signal Processing*, 2019.
- [3] O. S. Rummukainen, S. J. Schlecht, and E. A. P. Habets, “Self-translation induced minimum audible angle,” *Journal of the Acoustical Society of America*, vol. 144, no. 4, EL340–EL345, Oct. 2018.
- [4] S. J. Schlecht and E. A. P. Habets, “Feedback delay networks: Echo density and mixing time,” *IEEE/ACM Transaction on Audio, Speech, and Language Processing*, vol. 25, no. 2, pp. 374–383, Feb. 2017.
- [5] S. J. Schlecht and E. A. P. Habets, “On lossless feedback delay networks,” *IEEE Transaction on Signal Processing*, vol. 65, no. 6, pp. 1554–1564, Mar. 2017.
- [6] S. J. Schlecht and E. A. P. Habets, “The stability of multichannel sound systems with time-varying mixing matrices,” *Journal of the Acoustical Society of America*, vol. 140, no. 1, pp. 601–609, Jul. 2016.
- [7] S. J. Schlecht and E. A. P. Habets, “Time-varying feedback matrices in feedback delay networks and their application in artificial reverberation,” *Journal of the Acoustical Society of America*, vol. 138, no. 3, pp. 1389–1398, Sep. 2015.

## Conferences

- [8] K. Prawda, S. J. Schlecht, and V. Välimäki, “Improved Reverberation Time Control for Feedback Delay Networks,” in *Proc. Int. Conf. Digital Audio Effects (DAFx)*, Birmingham, UK, Sep. 2019, pp. 1–7.
- [9] O. S. Rummukainen, S. J. Schlecht, T. Robotham, A. Plinge, and E. A. P. Habets, “Perceptual Study of Near-Field Binaural Audio Rendering in Six-Degrees-of-Freedom Virtual Reality,” in *IEEE Virtual Reality (VR)*, Osaka, Japan: IEEE Virtual Reality, Mar. 2019, pp. 1–7.
- [10] M. Schäfer, S. J. Schlecht, and R. Rabenstein, “Feedback Structures for a Transfer Function Model of a Circular Vibrating Membrane,” in *Proc. IEEE Workshop Applicat. Signal Process. Audio Acoust. (WASPAA)*, New Paltz, NY, USA, Oct. 2019, pp. 1–5.
- [11] S. J. Schlecht and E. A. P. Habets, “Dense Reverberation with Delay Feedback Matrices,” in *Proc. IEEE Workshop Applicat. Signal Process. Audio Acoust. (WASPAA)*, New Paltz, NY, USA, Oct. 2019, pp. 1–5.

- [12] C. Weiß, S. J. Schlecht, S. Rosenzweig, and M. Müller, “Towards Measuring Intonation Quality of Choir Recordings: A Case Study on Bruckner’s Locus Iste,” in *Proceedings of the 20th International Society for Music Information Retrieval Conference (ISMIR)*, Delft, The Netherlands, Nov. 2019.
- [13] A. Plinge, S. J. Schlecht, O. Thiergart, T. Robotham, O. S. Rummukainen, and E. A. P. Habets, “Six-Degrees-of-Freedom Binaural Audio Reproduction of First-Order Ambisonics with Distance Information,” in *AES International Conference on Audio for Virtual and Augmented Reality*, Redmond, WA, USA: Audio Engineering Society, Aug. 2018, pp. 1–10.
- [14] O. S. Rummukainen, T. Robotham, S. J. Schlecht, A. Plinge, J. Herre, and E. A. P. Habets, “Audio Quality Evaluation in Virtual Reality: Multiple Stimulus Ranking with Behavior Tracking,” in *AES International Conference on Audio for Virtual and Augmented Reality*, Redmond, WA, USA: Audio Engineering Society, Aug. 2018, pp. 1–10.
- [15] S. J. Schlecht, B. Alary, V. Välimäki, and E. A. P. Habets, “Optimized velvet-noise decorrelator,” in *Proc. Int. Conf. Digital Audio Effects (DAFx)*, Aveiro, Portugal, Sep. 2018, pp. 1–8.
- [16] S. J. Schlecht and E. A. P. Habets, “Sign-Agnostic Matrix Design for Spatial Artificial Reverberation with Feedback Delay Networks,” in *AES Conference on Spatial Reproduction*, Tokyo, Japan: Audio Engineering Society, Jul. 2018, pp. 1–10.
- [17] O. S. Rummukainen, S. J. Schlecht, A. Plinge, and E. A. P. Habets, “Evaluating binaural reproduction systems from behavioral patterns in a virtual reality—A case study with impaired binaural cues and tracking latency,” in *Audio Engineering Society Convention 143*, New York, NY, USA: Audio Engineering Society, Oct. 2017, pp. 1–8.
- [18] O. S. Rummukainen, S. J. Schlecht, A. Plinge, and E. A. P. Habets, “Evaluation of binaural reproduction systems from behavioral patterns in a six-degrees-of-freedom wayfinding task,” in *Quality of Multimedia Experience (QoMEX)*, Erfurt, Germany: IEEE, Jun. 2017, pp. 1–3.
- [19] S. J. Schlecht and E. A. P. Habets, “Accurate reverberation time control in feedback delay networks,” in *Proc. Int. Conf. Digital Audio Effects (DAFx)*, Edinburgh, UK, Aug. 2017, pp. 337–344.
- [20] S. J. Schlecht and E. A. P. Habets, “Practical considerations of time-varying feedback delay networks,” in *Proc. Audio Eng. Soc. Conv.*, Warsaw, Poland, May 2015, pp. 1–9.
- [21] S. J. Schlecht and E. A. P. Habets, “Reverberation enhancement systems with time-varying mixing matrices,” in *Proc. Audio Eng. Soc. Conf.*, Montreal, Canada, Jul. 2015, pp. 1–8.
- [22] S. J. Schlecht and E. A. P. Habets, “Connections between parallel and serial combinations of comb filters and feedback delay networks,” in *International Workshop on Acoustic Signal Enhancement (IWAENC)*, Aachen, Germany, Sep. 2012, pp. 1–4.



- [23] S. J. Schlecht and E. A. P. Habets, “Reverberation enhancement from a feedback delay network perspective,” in *Convention of Electrical & Electronics Engineers in Israel (IEEEI)*, Eilat, Israel: IEEE, Nov. 2012, pp. 1–5.

## Patent

- [24] S. J. Schlecht, E. A. P. Habets, A. Silzle, C. Borß, H. Stenzel, and B. Neugebauer, “Apparatus and method for generating output signals based on an audio source signal, sound reproduction system and loudspeaker signal,” WO 2016/071206 A1, May 2015.

## Thesis

- [25] S. J. Schlecht, “Feedback delay networks in artificial reverberation and reverberation enhancement,” PhD thesis, Erlangen, Germany, Oct. 2017.
- [26] S. J. Schlecht, “Source-filter separation for bowed string instruments and its application for advanced audio effects,” Master’s thesis, London, UK, Aug. 2011.
- [27] S. J. Schlecht, “Options and limits of feedback delay networks for artificial reverberation of audio signals,” Master’s thesis, Trier, Germany, Jun. 2010.