

Randy Frans Fela, PhD

R&D Engineer, Perceptual Audio-visual Evaluation

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Profile

PhD holder in the perceptual evaluation of audio, video, and audiovisual content, with seven years of experience building thorough methodology that connects technical performance with real-world listening outcomes. Since 2022 at GN Store Nord (Jabra), I have also contributed to hearing-aid DSP evaluation alongside GN Hearing scientists, helping define evaluation metrics and conducting critical listening of DSP candidate solutions, while building and now running a 100-member trained assessor panel used across an international product organization to bridge laboratory measurement and everyday listening performance.

Professional Experience

R&D Engineer, Perceptual Audio-visual Evaluation · GN Store Nord / Jabra, Denmark Jul 2022 – Present

- Design and run perceptual studies from early research concepts through final release, balancing statistical rigor against real product-timeline constraints, and translate findings into technical and product recommendations for cross-functional teams.
- Established and maintain the GN Global Assessor Panel (>100 members) under ISO 8586:2012, covering screener design, reliability monitoring, and long-term panel consistency, the kind of rigorous human-subject infrastructure that static lab testing alone cannot replace.
- Built and maintain **GEMA for audio/speech** and **OPTIQ for image/video**, internal Python evaluation frameworks (90+ objective and predictive metrics combined) now used across multiple GN product teams as reference benchmarks connecting technical measurement to perceived product quality.
- Contribute to research and development across GN product lines in collaboration with research scientists, helping define evaluation metrics, participating in validation discussions, and conducting critical listening assessment of DSP candidate solutions to inform real-world listening performance ahead of product release.
- Co-authored a submitted Innovation Fund Denmark proposal (GN Store Nord, DTU, IT University of Copenhagen) on human perception of super-resolution video in hybrid meeting scenarios.

Industrial PhD Researcher · FORCE Technology (SenseLab) and DTU, Denmark Jan 2019 – Nov 2022

- Designed and ran perceptual quality studies combining spatial audio and 360° video, connecting objective measurement, simulated listening conditions, and human response; released the open-access HOA-SSR dataset.
- Conducted client-commissioned benchmark testing of professional and consumer webcams for image and audio quality under real transmission-network conditions.
- Applied psychophysical methods, including head-eye motion tracking, to model real listening and viewing behavior in immersive environments.

Education

PhD, Electrical Engineering · Technical University of Denmark (DTU) and FORCE Technology Jan 2019 – Nov 2022

- Industrial PhD, EU Marie Skłodowska-Curie Actions funded (RealVision ITN). Thesis: *Perceptual Evaluation of Immersive Audiovisual Quality*. Defended November 2022, degree conferred January 2023.
- Supervisors: Nick Zacharov, D.Sc. (Tech.) (Meta Reality Labs), Prof. Søren Otto Forchhammer (DTU).

M.Eng. in Engineering Physics · Bandung Institute of Technology (ITB), Indonesia Aug 2016 – Jul 2018

- Thesis: *Auditory and Audiovisual Perception in VR Environments*. Visiting research, Acoustics Research Center, University of Salford, UK (2017).

Grants and Funding Proposals

- **Scene-Aware Video Processing for Next-Generation Hybrid Meetings**. Submitted funding proposal, Innovation Fund Denmark, 2026. Collaboration between GN, DTU, and the IT University of Copenhagen. Role: co-author.

Teaching and Mentoring

- Co-supervisor, undergraduate and Master's theses, DTU and Aalborg University (2022–present); all students graduated with top distinctions. Mentor to interns from TU Berlin.
- Currently support the research of a PhD student jointly affiliated with ITU Copenhagen and DTU.

Relevant Publications

- **Fela, R.F.**, Mowlae P. *Perceptually Better, Semantically Worse: Measuring Speech Enhancement Impact on LLM-Based Voice Systems*. Accepted, EMNLP 2026.
- **Fela, R.F.**, Mowlae P. *Conformal Uncertainty for No-Reference MOS Prediction under Distribution Shift: A Leakage-Controlled Study* Submitted, ICASSP 2027.
- **Fela, R.F.**, et al. *Multimodal Perceptual Quality Evaluation of 360 Media: Dataset, Metrics and Models*. Under review, IEEE Trans. Multimedia.
- Takeuchi M., Marozeau J., **Fela, R.F.**, Gkanos K., Nørholm S.M. (2024). *Evaluation of One's Own Voice Perception while Using In-ear Headsets*. AES 4th Intl. Conf. on Audio and Music Induced Hearing Disorders, Copenhagen.
- **Fela, R.F.**, Zacharov N., Forchhammer S. (2023). *Comparison of Full Factorial and Optimal Experimental Design for Perceptual Evaluation of Audiovisual Quality*. **JAES**, vol. 71, no. 1/2, pp. 4–9.
- **Fela, R.F.**, Zacharov N., Forchhammer S. (2022). *Assessor Selection Process for Perceptual Quality Evaluation of 360 Audiovisual Content*. **JAES**, vol. 70, no. 10, pp. 824–842.
- **Fela, R.F.**, Pastor A., Le Callet P., Zacharov N., Vigier T., Forchhammer S. (2022). *Perceptual Evaluation on Audio-visual Dataset of 360 Content*. **IEEE ICMEW 2022**, Taipei.
- **Fela, R.F.**, Zacharov N., Forchhammer S. (2021). *Perceptual Evaluation of 360 Audiovisual Quality and Machine Learning Predictions*. **IEEE MMSP 2021**, Tampere.
- **Fela, R.F.**, Zacharov N., Forchhammer S. (2020). *Towards a Perceived Audiovisual Quality Model for Immersive Content*. **IEEE QoMEX 2020**, Dublin.
- 13 further peer-reviewed publications on perceptual and audiovisual quality evaluation, 2020–2022 (full list on Google Scholar).

Patent Disclosures

- Two invention disclosures, *device performance in real rooms* and *automatic raters*. Under decision process by internal patent committee (2025 – 2026).

Selected Talks

- Presenter, GN Advanced Science Annual Conference, Ballerup, Denmark (2025, 2026).
- Invited speaker, Faculty of Engineering, Universitas Gadjah Mada, Universitas Andalas, Institut Teknologi Sumatera, and Universitas Negeri Padang, Indonesia (2023 to 2024).
- Presenter, IEEE ICMEW 2022, Taipei; IEEE MMSP 2021, Tampere; IEEE QoMEX 2020, Dublin.
- Participant, Danish Sound Day 2023, Rigshospitalet, København.
- Speaker, SenseCamp '19 and '20, FORCE Technology, on perceptual quality evaluation and machine learning for hyper-realistic and immersive multimedia.
- RealVision ITN Fellow Meetings, Fraunhofer IIS (Germany) and University of Oxford (UK), on computational imaging and vision psychophysics.

Traning, Awards / Professional Memberships

- **Recent training.** Building and Deploying Deep Learning Applications with TensorFlow; MLOps Essentials (model development and integration); Machine Learning with Python and Data Analysis with Python (freeCodeCamp, 300 hours each, five projects each); SQL Essential Training.
- Winner, Microsoft Power Platform Hackathon, hosted by GN Store Nord and Microsoft (2024).
- Audio Engineering Society (AES); Institute of Electrical and Electronics Engineers (IEEE); Marie Curie Alumni Association; Australia Awards Alumni.