Nicolas Gninenko, PhD

Work address:
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1202 Geneva, Switzerland

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Current Activities

Jun 22 – present
Neuroscientist
Neurosoft Bioelectronics, Campus Biotech, Geneva, Switzerland

Leading tinnitus research and related clinical activities with the aim of developing a minimally invasive brain implant to alleviate chronic severe tinnitus

Jan 25 – present
Senior Scientist
Medical Image Processing Laboratory, Neuro-X Institute, EPFL, Switzerland

Recipient of the American Tinnitus Association (ATA) Early Investigator Award (USD 50,000 over a 2-year research project). Investigating higher-order brain networks in tinnitus during fMRI neurofeedback (role: Principal Investigator)

Apr 23 – Dec 24
Postdoctoral Researcher
Department of Neurology, University of Fribourg, Fribourg, Switzerland

Continuation of the work started at University of Bern — neuroimaging research on FND; continued supervision of PhD projects (with Prof. Selma Aybek)

Jun 22 – Mar 23
Postdoctoral Researcher
Department of Neurosciences, University of Bern, Bern, Switzerland
Department of Neurology, Bern University Hospital (INSEL), Bern, Switzerland

Conducting neuroimaging research on functional neurological disorder (FND); supervision of PhD projects related to interoception in FND, fMRI neurofeedback for FND, and functional brain network dynamics in chronic pain patients (with Prof. Selma Aybek)

Education

Apr 17 – Apr 22
PhD in Electrical Engineering
Medical Image Processing Laboratory, Neuro-X Institute, EPFL, Switzerland

Neuroimaging and tinnitus research; Thesis: Real-Time fMRI Neurofeedback: Methods and Application to Chronic Tinnitus

Sep 13 – Mar 16
MSc in Bioengineering, Minor in Neuroprosthetics, EPFL, Switzerland

MSc thesis: High-Quality 3D Movie Reconstruction of Spontaneous Brain Activity; Minor semester project: A MATLAB Interface for Peripheral Vestibular Stimulation and Recording of Vestibular Electrically Evoked Compound Action Potentials

Sep 09 – Jul 13
BSc in Life Sciences & Technologies, EPFL, Switzerland

BSc project: Total Activation Regularization Applied to fMRI Data during Olfactory Stimulation

Professional Experience

Sep 16 – Mar 17 **Research Assistant**
Medical Image Processing Laboratory, Neuro-X Institute, EPFL, Switzerland

Advancing Early Diagnosis of Alzheimer's Disease using Arterial Spin Labeling Imaging

Aug 15 **Research Intern**
Speech and Audio Processing Group, IDIAP Research Institute, Martigny, Switzerland

Development and analysis of algorithms that model human speech perception — specifically, algorithms that predict the intelligibility of speech signals

Teaching

Jun 22 – present **PhD Projects Supervision**
Department of Neurology, University of Fribourg, Fribourg, Switzerland

Doctoral Thesis: Eliane Müller — Real-Time fMRI Neurofeedback in Functional Neurological Disorder (Graduate School for Cellular and Biomedical Sciences (GCB), University of Bern, Bern, Switzerland)

Jan 23 – Dec 24 **EPFL Alumni Mentoring**
Voluntary career coaching for future graduate students (EPFL, Switzerland)

Apr 17 – present **MSc and Other Projects Supervision**
Medical Image Processing Laboratory, Neuro-X Institute, EPFL, Switzerland

MSc Semester Project: Federico Mengozzi — Dynamics of Brain Networks in Tinnitus during Auditory Down-Regulation (Feb 25 – present)
EPFL E3 Summer Internship: Mohammad Armin Dehghan — Source Reconstruction of EEG Neurofeedback Data from the *NeuroTin* project (Jul 24 – Aug 24)
MSc Semester Project: Loïc Comeliau — Analysis of EEG Neurofeedback Data in a Clinical Population of Chronic Tinnitus (2022)
MSc Semester Project: Anja Đajić — Development of a Segmentation Tool to Measure Subcutaneous Implant Volumes from 14.1 T MRI Data (2021)
MSc Thesis: Mouni Amrane — fMRI Neurofeedback for Tinnitus Treatment: What Is the Contribution of the Autonomic System? (2020)
MSc Semester Project: Lazar Stojković — Exploring Network Percolation Approaches for Structural and Functional MRI Brain Graphs Matching (2020)
MSc Semester Project: Baha Ferchichi — Fast Online Deconvolution of Neuronal Activity for fMRI Imaging (2019)
Internship: Lazar Stojković — Development of New fMRI Neurofeedback Visualizations, in collaboration with the EPFL+ECAL Lab (2019)
MSc Semester Project: Ari Sarfatis — Real-Time fMRI Motion Correction and Monitoring Module (2018)
Short Internships: Jeanette Popovova and Naz Doganci (University of Geneva, Geneva, Switzerland) — DWI Data Analysis Pipelines (2019, 2017)
Student Assistants: Laurine Kolly, Lena Bruhin, Fatemeh Ghadamieh, Anastasia Bouzdine, Kaleem Corbin, Elisabetta Pagliara, Mariana Falcão, MRI scanning assistance during the *NeuroTin* project (2018–2020)

Apr 17 – Mar 21 **Teaching Assistant (PhD)**
EPFL, Switzerland — *Courses:* Imaging Processing I, II, Signal Processing for Functional Brain Imaging

Sep 12 – Jan 15 **Teaching Assistant (BSc/MSc)**
EPFL, Switzerland— *Courses:* Analysis I, II, General Physics I, II, Numerical Analysis

Awards

Jun 25	**American Tinnitus Association (ATA) Innovative Research Grant** Project: Mapping Higher-Order Brain Network Mechanisms of Tinnitus During fMRI Neurofeedback (USD 50,000)
Feb 17	**CTI Business Concept Award**, Innosuisse, Lausanne, Switzerland Lausanne Winning Team Fall 2016 (Finalists at Imperial College, London)

Talks & Seminars

Aug 25 (invited talk)	**32nd Annual International Conference on the Management of the Tinnitus & Hyperacusis Patient**, University of Iowa, Iowa City, IA, USA From fMRI neurofeedback to a minimally invasive implantable brain computer interface (iBCI) for chronic severe tinnitus
Apr 25 (invited talk)	**Adult Loss of Hearing Association (ALOHA)**, Tucson, AZ, USA
Sep 24	**36th World Congress of Audiology**, Paris, France Functional MRI neurofeedback for chronic tinnitus: A randomized clinical trial
Mar 24 (invited talk)	**51ème Congrès de la Société Française de Neuroradiologie**, Paris, France Le neurofeedback guidé par IRMf pour les acouphènes chroniques
Jun 23	**Tinnitus Research Initiative (TRI) Conference**, Trinity College Dublin, Dublin, Ireland The mechanisms of neurofeedback in chronic severe tinnitus
Oct 22	**Real-Time Functional Imaging and Neurofeedback Meeting (rtFIN) 2022**, Yale University, New Haven, CT, USA NeuroTin: Physiological regulation of chronic tinnitus through fMRI-based neurofeedback
Jun 22	**BBL-CIBM-FCBG Research Day 2022**, University of Geneva, Geneva, Switzerland Real-Time fMRI Neurofeedback for Chronic Tinnitus
Nov 21 (invited talk)	**USZ Tinnitus-Neuroimaging Workshop**, Universitätsspital Zürich (USZ), Zürich, Switzerland Physiological Regulation of Chronic Tinnitus through fMRI-based Neurofeedback (NeuroTin)
Sep 21 (invited talk)	**Hearing Forum Andermatt**, Andermatt, Switzerland Physiological Regulation of Chronic Tinnitus through fMRI-based Neurofeedback (NeuroTin)
Jul 19	**World Conference of Science Journalists**, Campus Biotech, Geneva, Switzerland A Journey into the Heart of Neurosciences, from Fundamental Research to Effective Applications — Neurofeedback to Shape Brain Activity
Oct 17	**Center for Neuroprosthetics (EPFL) Annual Workshop**, Annecy, France Applications of Real-Time fMRI Neurofeedback

Publications

Preprints

Gninenko, N., Senn, P., Haller, S., Van De Ville, D. (2025). Altered parietal multisensory integration in chronic tinnitus during closed-loop auditory downregulation (**under review** in *NeuroImage: Clinical*).

Müller, E., Loukas S., Häuselmann S., Concetti, C., Van De Ville, D., **Gninenko N.*** & Aybek, S.* (2025). Modulating the sense of agency in functional neurological disorder using real-time fMRI neurofeedback: a proof-of-concept study (**under review** in *NeuroImage: Clinical*).

De Ridder, D., Raymaekers, V., Plazier, M., **Gninenko, N.** (2024). Cortical stimulation in chronic tinnitus (**book chapter**; Textbook of Neuromodulation: Principles, Methods and Clinical Applications, 2nd edition; **currently with eds.** Helena Knotkova & Dirk Rasche).

Peer-Reviewed Publications

Stoffel N., Sojka, P., **Gninenko, N.** *et al.* (2025). Respiratory Sensitivity is Reduced in Functional Neurological Disorder and Associated with Higher Somatoform Dissociation. *Brain Commun* 7:4(fcaf283). DOI: 10.1093/braincomms/fcaf283

Gninenko, N., Müller, E., Aybek, S. (2025). Reduced microstructural white matter integrity is associated with the severity of physical symptoms in functional neurological disorder. *NeuroImage Clin* 46:103791. DOI: 10.1016/j.nicl.2025.103791

Dhanis, H., **Gninenko, N.**, Morgenroth, E. *et al.* (2024). Real-time fMRI neurofeedback modulates induced hallucinations and underlying brain mechanisms. *Commun Biol* 7:1120. DOI: 10.1038/s42003-024-06842-x

Gninenko, N., Trznadel, S., Daskalou, D. *et al.* (2024). Functional MRI Neurofeedback Outperforms Cognitive Behavioral Therapy for Reducing Tinnitus Distress: A Prospective Randomized Clinical Trial. *Radiology* 310:2. DOI: 10.1148/radiol.231143

Adda, J., Bioley, G., Van De Ville, D., ..., **Gninenko, N.** (2023). Automated segmentation and labeling of subcutaneous mouse implants at 14.1T. *Front Signal Process* 3:1155618. DOI: 10.3389/frsip.2023.1155618

Davydov, N., Peek, L., Auer, T., ..., **Gninenko, N.** *et al.* (2022). Real-time and Recursive Estimators for Functional MRI Quality Assessment. *Neuroinform* 20:897–917. DOI: 10.1007/s12021-022-09582-7

Ros, T., Enriquez-Geppert, S., Zotev, V., ..., **Gninenko, N.** *et al.* (2020). Consensus on the reporting and experimental design of clinical and cognitive-behavioural neurofeedback studies (CRED-nf checklist). *Brain* 143(6):1674–85. DOI: 10.1093/brain/awaa009

Van der Thiel, M., Rodriguez, C., Giannakopoulos, P., ..., **Gninenko, N.**, Van De Ville, D., Haller, S. (2018). Brain Perfusion Measurements Using Multidelay Arterial Spin-Labeling Are Systematically Biased by the Number of Delays. *AJNR Am J Neuroradiol* 39(8):1432–8. DOI: 10.3174/ajnr.A5717

Invited Podcasts

Gninenko, N. Hosted by Callahan, J. (5 Aug 2024). Revolutionizing the Training of Medical Professionals Insights from Neuroscientist Nicolas Gninenko. *Skeleton Crew by X-Ray Tech*

Gninenko, N. & Haller, S. Hosted by Dr. Deng, F. (2 Apr 2024). Functional MRI Neurofeedback for Treatment of Tinnitus. *Radiology Podcasts*. DOI: 10.1148/radiol.231143.podcast

Conference Proceedings

Cai, D., Groves, E., Défayes, L., Naas, A., **Gninenko, N.**, Shabestari, P. S., Henchoz, N., Kleinjung, T., Sonderegger, A., Neff, P., Ribes, D. (2025). Designing Feedback Stimuli in Neurofeedback: Preliminary Requirements from Experts and Users. *2025 IEEE 38th International Symposium on Computer-Based Medical Systems (CBMS), Madrid, Spain*, pp. 941–44. DOI: 10.1109/CBMS65348.2025.00188

Posters & Abstracts

Häuselmann, S., Wyss, A., Weber, S., **Gninenko, N.**, Bischoff, N., Berna, C., Holtforth, M. G., Aybek, S. (2025). Temporal dynamics of brain activity in relation to pain sensitivity and stress in patients with chronic primary pain. GCB Symposium 2025, University of Bern, Bern, Switzerland

Müller, E., **Gninenko N.**, Loukas S., Van De Ville, D., Aybek, S. (2025). Real-Time Functional Magnetic Resonance Imaging Neurofeedback in Functional Neurological Disorder: A Proof-of-Concept Study. GCB Symposium 2025, University of Bern, Bern, Switzerland

Cai, D., Groves, E., Défayes, L., Naas, A., **Gninenko N.**, Shabestari, P. S., Kleinjung, T., Sonderegger, A., Neff, P., Ribes, D. (2025). Designing Feedback Stimuli in Neurofeedback: Preliminary Requirements from Experts and Users. 38th IEEE International Symposium on Computer-Based Medical Systems 2025, Madrid, Spain

Müller, E., **Gninenko N.**, Loukas S., Van De Ville, D., Aybek, S. (2024). Real-Time fMRI Neurofeedback of the Right Temporoparietal Junction in Functional Neurological Disorder: A Proof-of-Concept Study. Real-Time Functional Imaging and Neurofeedback Conference (rtFIN) 2024, Heidelberg, Germany

Müller, E., **Gninenko N.**, Loukas S., Van De Ville, D., Aybek, S. (2024). Real-Time Functional Magnetic Resonance Imaging Neurofeedback in Functional Neurological Disorder: A Proof-of-Concept Study. Alpine Brain Imaging Meeting 2024, Champéry, Switzerland

Gninenko, N., Scheltienne, M., Trznadel, S., Robyn, C. L., Daskalou, D., Haller, S., Senn, P., Van De Ville, D. (2022). NeuroTin: a clinical trial on fMRI and EEG neurofeedback vs. group cognitive behavioral therapy (CBT) for chronic tinnitus. Alpine Brain Imaging Meeting 2022, Champéry, Switzerland

Dhanis, H., **Gninenko, N.**, Faivre, N., Rognini, G., Potheegadoo, J., Blanke, O., Van De Ville, D. (2022). Bi-directional control over networks associated with robotically mediated hallucinations through co-activation pattern based real-time fMRI neurofeedback. Alpine Brain Imaging Meeting 2022, Champéry, Switzerland

Davydov, N., Prilepin, E., Auer, T., **Gninenko, N.**, Khramov, A., Van De Ville, D., Nikonorov, A., Koush, Y. (2020). Recurrent quality assessment and real-time head motion detection of real-time fMRI using OpenNFT. Organization for Human Brain Mapping (OHBM) 2020, Online

Dhanis, H., **Gninenko, N.**, Faivre, N., Rognini, G., Potheegadoo, J., Van De Ville D., Blanke O. (2020). Control over brain networks associated with robotically mediated hallucinations through dynamic functional connectivity based real-time fMRI neurofeedback. Alpine Brain Imaging Meeting 2020, Champéry, Switzerland

Dhanis, H., **Gninenko, N.**, Faivre, N., Rognini, G., Potheegadoo, J., Van De Ville D., Blanke O. (2019). Control over brain networks associated with robotically mediated hallucinations through dynamic functional connectivity based real-time fMRI neurofeedback. Real-Time Functional Imaging and Neurofeedback Conference (rtFIN) 2019, Maastricht–Aachen, Netherlands–Germany

Davydov, N., Prilepin, E., Auer, T., **Gninenko, N.**, Sarfatis, A., Khramov, A., Van De Ville, D., Nikonorov, A., Koush, Y. (2019). Functional MRI recurrent quality assessment and head motion estimation using OpenNFT. Real-Time Functional Imaging and Neurofeedback Conference (rtFIN) 2019, Maastricht–Aachen, Netherlands–Germany

Gninenko, N., Zaidi, A., Khaliliardali, Z., Trznadel, S., Senn, P., Sitaram, R., Haller, S., Van De Ville, D., Birbaumer, N. (2019). Real-time fMRI neurofeedback training for chronic tinnitus (*NeuroTin*). Organization for Human Brain Mapping (OHBM) 2019, Rome, Italy

Gramatica, L., **Gninenko, N.**, Trznadel, S., Khaliliardali, Z., Spadazzi, A., Spigoni, G., Birbaumer, N., Van De Ville, D., Haller, S., Senn, P. (2019). Exploring MRI neurofeedback as a treatment for chronic tinnitus. Swiss Society of Oto-Rhino-Laryngology Spring 2019 Meeting, Davos, Switzerland

Gninenko, N., Sarfatis, A., Koush, Y., Van De Ville, D. (2018). A versatile & lightweight fMRI real-time motion monitoring tool for neurofeedback and standalone use. Organization for Human Brain Mapping (OHBM) 2018, Singapore

Languages & Skills

French	Native Speaker
English	Fluent (C1–C2)
German	Basic (A2–B1)
Italian	Learning (A1)

Programming	python, MALTAB, Mathematica, R, bash, java
Software	Latex, Inkscape, Adobe Illustrator, Adobe Audition, Microsoft Office Suite
Neuroimaging	FSL, FreeSurfer, SPM, AFNI, mrtrix3, PsychToolbox
Hardware	Certified Siemens Prisma 3T MRI Operator

Reviewer Activity

Reviewed manuscripts for ≥ 13 scientific journals (Brain Communications, Radiology: Artificial Intelligence, Consciousness and Cognition, Neuroradiology, Brain Imaging and Behavior, NeuroImage, Neuroimage: Clinical, NeuroImage: Reports, Frontiers in Neuroscience, Frontiers in Audiology and Otology, Frontiers in Neurology, Psychiatry and Clinical Neurosciences, Journal of Medical Internet Research)

Web of Science public profile: https://www.webofscience.com/wos/author/record/GVT-9800-2022

Courses & Conferences

Sep 24	36th World Congress of Audiology, Paris, France
Jun 24	5th International Conference on Functional Neurological Disorder, Verona, Italy
Mar 24	51ème Congrès de la Société Française de Neuroradiologie, Paris, France
Feb 24	Tinnitus Symposium: The Sound of Progress, Delft University of Technology, Delft, Netherlands
Feb 24	Scientific Exchange on Interoception and Predictive Coding in Functional Neurological Disorders, Saas-Fee, Switzerland
Jan 18–22, 24	Alpine Brain Imaging Meeting (ABIM), Champéry, Switzerland
Jun 23	Tinnitus Research Initiative (TRI) Conference, Dublin, Ireland
Oct 22	Real-Time Functional Imaging and Neurofeedback (rtFIN) Conference, Yale University, New Haven, CT, USA
Sep 20	Advanced Topics in Network Neuroscience, EPFL, Lausanne, Switzerland
Jun 18–20	Organization for Human Brain Mapping (OHBM), Singapore/Rome/Online
May 20	Statistical Sequence Processing, EPFL, Lausanne, Switzerland
Jan 20	Stanford-EPFL Neuroscience Symposium, EPFL, Lausanne, Switzerland
Jan 20	APMP 5th International Meeting, ETH Zürich, Zürich, Switzerland
Dec 19	Real-Time Functional Imaging and Neurofeedback (rtFIN) Conference, Maastricht, Netherlands
Jun 19	Computation Optimal Transport, EPFL, Lausanne, Switzerland
Nov 17	Entrepreneurial Opportunity Identification and Exploitation, EPFL, Lausanne, Switzerland
Sep 17	Advanced Biomedical Imaging Methods and Instrumentation, EPFL, Lausanne, Switzerland
Sep 16	CTI Entrepreneurship Training (Business Concept), Innosuisse, Lausanne, Switzerland