Antoine Honoré, Ph.D.

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Research Area

AI Researcher with strong experience at the intersection of AI, biology and medicine. I have designed deep generative models for sepsis detection in preterm infants from time series data. My current research focuses on multimodal data integration: protein structures, deep mutational scans and multiple sequence alignments, for variant effect prediction in drug transporter proteins.

Education

2018 – 2023 **Ph.D., KTH Royal Institute of Technology, Stockholm, Sweden**
AI for medical diagnostics.
Thesis title: *Perspectives of Deep Learning for Neonatal Sepsis Detection.*

2013 – 2016 **M.Sc. Grenoble INP PHELMA, Grenoble, France** in Electrical Engineering.
Double degree with KTH Royal Institute of Technology, Stockholm, Sweden.
Majors: *Signal Processing, Optimization*.

2011 – 2013 **CPGE, Lycée Victor Grignard, Cherbourg, France**
Majors: *Mathematics and Theoretical Physics*.

Employment

2023 – 2025 **Postdoc,** KTH Royal Institute of Technology, Stockholm, Sweden.
Project: Predicting Chemotherapy Sensitivity using Graph Neural Networks Based on Deep Mutational Scanning

2023 – **Associated researcher,** Karolinska Institutet, Stockholm, Sweden.
Project: Conducting and performing retrospective clinical studies with the neonatal transfusion network: Oxford, Charité Berlin, Karolinska Institutet

2016 – 2018 **Research assistant,** Karolinska Institutet, Stockholm, Sweden.

Research Publications

Journal Articles

1. J. Bodlund, A. Wimmerdahl, **A. Honoré**, K. P. Härenstam, and D. Forsberg, "A retrospective evaluation of SwePEWS use in paediatric patients with COVID-19 and RSV infection," *Acta Paediatrica*, vol. n/a, no. n/a, ISSN: 1651-2227. DOI: 10.1111/apa.17450.

2. A. Ghosh, **A. Honoré**, and S. Chatterjee, "DANSE: Data-driven Non-linear State Estimation of Model-free Process in Unsupervised Learning Setup," *IEEE Transactions on Signal Processing*, pp. 1–14, 2024, ISSN: 1941-0476. DOI: 10.1109/TSP.2024.3383277.

3. **A. Honoré**, D. Forsberg, K. Adolphson, S. Chatterjee, K. Jost, and E. Herlenius, "Vital sign-based detection of sepsis in neonates using machine learning," *Acta Paediatrica*, vol. n/a, no. n/a, Jan. 2023, ISSN: 1651-2227. DOI: 10.1111/apa.16660.

4. A. M. Stålhammar, **A. Honoré**, K. Adolphson, D. Forsberg, E. Herlenius, and K. Jost, "Weight a minute: The smaller and more immature, the more predictable the autonomic regulation?" *Acta Paediatrica*, vol. 112, no. 7, pp. 1443–1452, 2023, ISSN: 1651-2227. DOI: 10.1111/apa.16796.

5. E. Persad, K. Jost, **A. Honoré**, *et al.*, "Neonatal sepsis prediction through clinical decision support algorithms: A systematic review," *Acta Paediatrica*, vol. 110, no. 12, pp. 3201–3226, 2021, ISSN: 1651-2227. DOI: 10.1111/apa.16083.

Conference Proceedings

1. A. Ghosh, **A. Honoré**, and S. Chatterjee, "DANSE: Data-Driven Non-Linear State Estimation of Model-Free Process in Unsupervised Bayesian Setup," in *2023 31st European Signal Processing Conference (EUSIPCO)*, Sep. 2023, pp. 870–874. DOI: 10.23919/EUSIPCO58844.2023.10289946.

2. **A. Honoré**, A. Ghosh, and S. Chatterjee, "Compressed Sensing of Generative Sparse-Latent (GSL) Signals," in *2023 31st European Signal Processing Conference (EUSIPCO)*, Sep. 2023, pp. 1918–1922. DOI: 10.23919/EUSIPCO58844.2023.10289923.

3. **A. Honoré**, H. Siren, R. Vinuesa, S. Chatterjee, and E. Herlenius, "An LSTM-based Recurrent Neural Network for Neonatal Sepsis Detection in Preterm Infants," in *2022 IEEE Signal Processing in Medicine and Biology Symposium (SPMB)*, Dec. 2022, pp. 1–6. DOI: 10.1109/SPMB55497.2022.10014948.

4. A. Ghosh, **A. Honoré**, D. Liu, G. E. Henter, and S. Chatterjee, "Robust Classification Using Hidden Markov Models and Mixtures of Normalizing Flows," in *2020 IEEE 30th International Workshop on Machine Learning for Signal Processing (MLSP)*, Sep. 2020, pp. 1–6. DOI: 10.1109/MLSP49062.2020.9231775.

5. **A. Honoré**, D. Liu, D. Forsberg, *et al.*, "Hidden Markov Models for Sepsis Detection in Preterm Infants," in *ICASSP 2020 - 2020 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, May 2020, pp. 1130–1134. DOI: 10.1109/ICASSP40776.2020.9054635.

6. D. Liu, **A. Honore**, S. Chatterjee, and L. K. Rasmussen, "Powering Hidden Markov Model by Neural Network based Generative Models," in *24th European Conference on Artificial Intelligenc*, Santiago de Compostela, Spain, 2020, p. 8. DOI: arXiv:1910.05744.

7. **A. Honoré**, V. Siljehav, S. Chatterjee, and E. Herlenius, "Large Neural Network Based Detection of Apnea, Bradycardia and Desaturation Events," in *NIPS ML4H 2017*, Long Beach Convention Center, Long Beach, CA.: arXiv, Nov. 2017. DOI: 10.48550/arXiv.1711.06484.

Book Chapters

1. **A. Honoré**, H. Siren, R. Vinuesa, S. Chatterjee, and E. Herlenius, "Deep Recurrent Architectures for Neonatal Sepsis Detection from Vital Signs Data," in *Machine Learning Applications in Medicine and Biology*, A. Ahmed and J. Picone, Eds., Cham: Springer Nature Switzerland, 2024, pp. 115–149, ISBN: 978-3-031-51893-5. DOI: 10.1007/978-3-031-51893-5_5.

2. D. Forsberg, **A. Honoré**, K. Jost, *et al.*, "AIM in Neonatal and Paediatric Intensive Care," in *Artificial Intelligence in Medicine*, N. Lidströmer and H. Ashrafian, Eds., Cham: Springer International Publishing, 2020, pp. 1–10, ISBN: 978-3-030-58080-3. DOI: 10.1007/978-3-030-58080-3_309-1.

Talks & Posters

Seminars & Workshops

Nov. 2023 — Visit at Biomedical Diagnosis lab, Eindhoven University of Technology, The Netherlands. **Invited talk**.

Talks & Posters (continued)

Oct. 2022 — "Health-related data and machine learning algorithms for healthcare". RISE Research Institutes of Sweden, Stockholm. **Invited speaker**.

Nov. 2019 — "Hidden Markov Models for Sepsis Detection in Preterm Infants". Digitalize in Sthlm. **Poster**.

Conferences

Sept. 2023 — "Compressed sensing of generative sparse-latent (GSL) signals", European Signal Processing Conference. **Poster**.

Dec. 2022 — "An LSTM-based Recurrent Neural Network for Neonatal Sepsis Detection in Preterm Infants". 2022 IEEE Signal Processing in Medicine and Biology Symposium. **Talk (online)**.

May. 2022 — "Hidden Markov Models for Sepsis Detection in Preterm Infants". 2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP). **Poster (online)**.

Dec. 2017 — "Large Neural Network Based Detection of Apnea, Bradycardia and Desaturation Events". NIPS ML4H 2017, Long Beach Convention Center, Long Beach, CA. **Poster**.

Skills

Programming — Python (pandas, numpy, sklearn, pytorch+cuda, lightning), Rust, C.

Systems — GNU/Linux, Bash, Powershell, Singularity, SLURM

Databases — PostgreSQL.

AI/ML — Deep generative models: VAE, Normalizing flows; Sequence/graph models: RNN, HMM, Transformers, GCN; Theory and practice of signal processing, convex optimization.

Miscellaneous

Committee Work

Oct. 2024 – Feb. 2025 — Member of the Scientific Program Committee for the 2nd Digital Futures Young Scientist Conference.

Teaching Assistant

2020 – 2023 — Speech and Audio Signal Processing (Spring).

2022 — Machine Learning and Data Science (Fall).

2021 – 2022 — Deep Neural Networks, Industry course (Spring).

2018 – 2019 — Pattern Recognition and Machine Learning (Spring).

Student Supervision

2024 — Catherine Weldone (KTH / Stanford medicine), KTH supervisor.

2023 — Laura Briffa (KTH/KI), KTH supervisor.

Alma Nordenstam (KTH/KI), KTH supervisor.

Rongfei Pan (KTH/Industry), KTH supervisor.

Sarah Reichhuber (KTH), main supervisor.

2022 — Henrik Siren (KTH), main supervisor.

Carolin Danker (KTH), co-supervisor.

Miscellaneous (continued)

2020 — Lila van Breugel (Monash University, Australia), co-supervisor.
— Jintai Liu (KI), co-supervisor.
2019 — Hanna Olsson (KI), co-supervisor.

Research Programs & Grants

2023 – 2025 — *WASP-DDLS* Postdoc funding.
2018 – 2023 — *KTH Digital Futures* Doctoral Program.
— Graduate School *MedBioInfo*.
2015 — Mobility Grant *Grenoble INP PHELMA/Région Rhône-Alpes*.

Academic Review Services

Conference — ICASSP, EUSIPCO.
Journal — Nature communications, Acta Paediatrica.

References

Available on Request