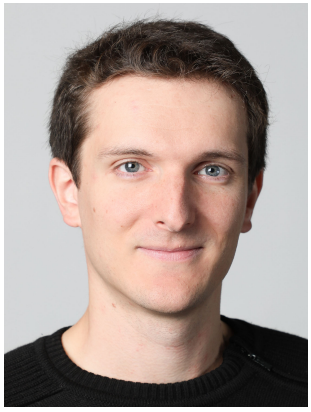
BENOIT SEGUIN



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Machine Learning Researcher & Engineer ◇ Deep learning & Data Science

Strengths

- *Team player*
- *Building state-of-the-art machine learning pipelines*
- *Full stack engineer with commitment to technical excellence*

EDUCATION

EPFL (Swiss Federal Institute of Technology in Lausanne) *September 2014 - September 2018*
PhD in Computer Science and Machine Learning

EPFL (Swiss Federal Institute of Technology in Lausanne) *September 2011 - June 2013*
MSc in Computer Science

École Polytechnique ParisTech *September 2008 - June 2013*
Diplôme d'Ingénieur Polytechnicien

PROFESSIONAL EXPERIENCE

Google Sept 2022 - Now
Senior Software Engineer *Zurich, Switzerland*

- Part of the "Applied Privacy Research" team.
- Implemented a self-service tool allowing supporting teams to generate comprehensive ML reports about Privacy or Security concerns based on User Feedback.
- Revamped the feedback analysis pipeline to allow instant insights through a dashboard about Trust concerns of our users.

ArtBeat.ai March 2021 - April 2022
CTO, co-founder

- Led a team of 3 to build an Art-Market comprehension engine.
- Created a large data acquisition, processing and alignment pipeline, for auction house and gallery data (gathering millions of prices/metadata/images across multiple sources),
- Developed a complex and explainable price-prediction model (out-performing experts 45% of the time) handling visual and financial information, hundred of thousands of artists, and complex metadata.
- Created and managed the backend/frontend deployment on scalable infrastructure.

Benoit Seguin, Consulting & Software Development January 2019 - April 2022
Independent ML Consultant for Heritage Institutions *Switzerland*

- Internationally recognised expertise in applying Machine Learning on Archive Data.
- Design and proof-of-concept of a system leveraging document analysis and image recognition for the automatic organization of the Photo-Archive of the Getty Research Institute (Los Angeles)
- Designed and developed a complete system for exploring textual correlations across millions of digitized pages of Architectural History for the ETH Library (Zurich) [link].

- Created a scalable system for visual search among millions of photographs from newspapers archives, leveraging Kubernetes/Dask/Tensorflow and a custom SOLR plugin (Luxemburg/Switzerland).
- Created and taught a 4 ECTS course for the ETHZ Architecture Faculty.

EPFL, Digital Humanities Lab September 2014 - November 2018
PhD Student / Research Assistant *Lausanne, Switzerland*

- Thesis title: "Making large-scale art historical photo archives searchable: A deep learning approach"
- Created, published and released [link] a reusable document processing pipeline [5], used by universities around the world and for processing the Venice Archives.
- Developed a first-of-its-kind deep reinforcement learning framework for automatic learning of electronic design automation (EDA) heuristics[4], opening the door to AI-driven circuit design.
- Developed a system for textual/visual exploration of large artwork datasets, which enabled users to specify how the underlying visual metrics should evolve with contrastive learning [7].
- Managed the processing of 50TB of digitized materials from the photo-archive of the Cini Foundation in Venice, creating the first ever visual search engine for tracking shape-reuse in art-history.
- Recurrent TA for the Machine Learning MSc course.

EPFL, Computer Vision Lab September 2013 - August 2014
Scientific Assistant *Lausanne, Switzerland*

- Implemented a fast multi-threaded prediction algorithm for mitochondria segmentation in Scanning Electron Microscopy (SEM) images.
- A prototype of integrating directly the predicting software during acquisition showed a 3x speed improvement with minimal quality decrease for the areas of interest.

IBM Research February 2013 - August 2013
Research Internship *Zurich, Switzerland*

- Proposed an automatic analysis tool [9] for the success and the variability of the lithography printing process for a specific pattern (based on image analysis of SEM images and error evaluation).
- Showed how VLSI patterns react differently according to variations in the printing conditions.

Carnegie Mellon University April 2011 - September 2011
Research Internship *Pittsburgh, USA*

- "Unsupervised object detection with an eye-tracking system"
- Leveraged the gaze information and a state-of-the-art optical flow algorithm to guide object segmentation with an experimental wearable eye-tracker.

TECHNICAL STRENGTHS

General	Machine Learning, Deep Learning, Computer Vision, Image Processing, Natural Language Processing, Backend Infrastructure, Big Data, Scalable Systems, Data Analysis, Data Mining, Data Viualization, Web Development, Relational Databases, NoSQL.
Languages / Tools	Python, Java, JavaScript, C++, Docker, bash, MATLAB, LaTeX, HTML, CSS, git, make, CMake, PostgreSQL, UNIX Systems, Kubernetes, Elasticsearch, Lucene/SOLR.
Frameworks / Libraries	PyTorch, TensorFlow, Keras, Theano, NumPy, scikit-learn, OpenCV, Django, Dask, Spark, Scrapy, Spacy, D3.js, Vue.js, PyBind, Cython.

ACHIEVEMENTS

- Qualified for the final round of GOOGLE HASHCODE 2016 (top-50 out of 1000+ teams)
- *Best Demonstration Award* at the Research Days of the CS Faculty of EPFL in 2017.

LANGUAGES

- ▶ French — Native
- ▶ English — Fluent
- ▶ German — Basic Proficiency (CEFR A2)
- ▶ Japanese — Basic Proficiency (JLPT N4)

EXTRACURRICULAR ACTIVITIES

- ▶ Classical Music (choir, piano) Organizer of the concerts for EPFL/UNIL choir in 2014-2017 (up to 2'000 people).
- ▶ Yoga
- ▶ Hiking

PUBLICATIONS

[1] Benoit Seguin, Lia Costiner, Isabella DiLenardo, and Frédéric Kaplan. New Techniques for the Digitization of Art Historical Photographic Archives—the Case of the Cini Foundation in Venice. In *Archiving Conference*, Washington D.C., 2018.

[2] Benoit Seguin. The Replica Project: Building a visual search engine for art historians. *ACM XROADS Magazine*, (Spring), 2018.

[3] Benoit Seguin. *Making large art historical photo archives searchable*. PhD thesis, EPFL, 2018.

[4] Winston Haaswijk*, Edo Collins*, Benoit Seguin*, Mathias Soeken, Frédéric Kaplan, Sabine Süsstrunk, and Giovanni De Micheli. Deep learning for logic optimization algorithms. In *IEEE International Symposium on Circuits and Systems (ISCAS)*. IEEE, 2018.

[5] Sofia Ares Oliveira*, Benoit Seguin*, and Frédéric Kaplan. DhSegment: A generic deep-learning approach for document segmentation. In *Proceedings of International Conference on Frontiers in Handwriting Recognition (ICFHR)*, 2018.

[6] Winston Haaswijk*, Edo Collins*, Benoit Seguin*, Mathias Soeken, Frédéric Kaplan, Sabine Süsstrunk, and Giovanni De Micheli. Deep learning for logic optimization. In *International Workshop on Logic Synthesis (IWLS)*. IEEE, 2017.

[7] Benoit Seguin, Carlotta Striolo, Isabella DiLenardo, and Frederic Kaplan. Visual Link Retrieval in a Database of Paintings. In *VISART Workshop, European Conference on Computer Vision (ECCV)*, volume 9913, pages 753–767, 2016.

[8] Isabella DiLenardo, Benoit Seguin, and Frédéric Kaplan. Visual Patterns Discovery in Large Databases of Paintings. In *Digital Humanities Conference*, 2016.

[9] Benoit Seguin, Henri Saab, Maria Gabrani, and Virginia Estellers. Estimating pattern sensitivity to the printing process for varying dose/focus conditions for RET development in the sub-22nm era. In *Metrology, Inspection, and Process Control for Microlithography XXVIII*, 2014.