Yann Gagnon Waterloo, ON, Canada

WORK EXPERIENCE

Lead AI Developer April 2021 – June 2024
Luxsonic Technologies (VR medical solutions) Waterloo, ON

➢ **Leading the development and implementation of all AI-driven solutions.**
Determined which AI functions to implement. Specified entire technical stack. Engaged with all external stakeholders. Completed technical scoping for a $1M image-guide therapy project and continue to lead its development. Supervised M.Sc. student's internship.

➢ **Implementing and evaluating machine learning algorithms.**
Implemented and evaluated 6 machine learning algorithms for imaging. Evaluated 3 speech-to-text models using own corpus of data. Created data ingestion pipeline. Created a refinement algorithm to detect and correct spurious results which runs in <0.05s.

➢ **Building cloud-based machine-learning infrastructure.**
Rendered all medical image analysis functionality accessible with a RESTful API using Python and Flask. Implemented model staging and other resource management methods. Implemented API versioning allowing rapid iteration. Maintained both development and production servers (>99% uptime).

➢ **Guiding UI/UX and human factors considerations.**
Provide continued guidance to a team of 5 from a user-centred workflow perspective. Created and iterated on over 50 user stories. Developed new functionality in VR application using Unity3D and C#. Prototype functionality using Jinja HTML templating engine.

Founder and CEO March 2017 – December 2020
ClearVoxel Imaging (human-in-the-loop AI for radiologists) Waterloo, ON

➢ **Founded a startup to enable AI adoption by radiologists and iterated on 3 prototypes.**
Started as an app-store for medical algorithms. >50 user interviews (algo devs, hospital IT, radiologists). Found it would worsen existing problems. Pivoted to gesture control with eye-tracking. Demo well received by 4 radiologists, but hardware too pricey. Final pivot to using eye-tracking to map visual search patterns to address 30% miss rate of plainly visible findings.

➢ **Managed all operational tasks of an early stage start-up.**
Pitched investors, secured $50K of seed funding, which I leveraged for additional $110K in grants. Filed provisional patent. 2019 Waterloo Medtech Top Startup Award. SIIM 2019 Innovation Award semi-finalist. 2019 Velocity Fund Finals winner. Recruited a co-founder and two employees.

➢ **Launched pilot study at breast cancer screening centre.**
Created prototype tailored to the review of mammography images. Built custom dual-screen eye-tracking setup with own designed mounting hardware. Recruited 7 radiologists. Collaborated with site lead for ethics review. Initiated data collection with 3 radiologists before halting for Covid-19.

➢ **Led the technical development of all 3 prototypes.**
Used own data and model to improve reliability of gesture recognition (3X est.) Implemented 2 ML algorithms for the classification of visual search. Industry-first dual-screen eye-tracking. Designed a transparent interaction layer compatible with existing clinical software, using WPF and C#.

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Imaging R&D Engineer May 2013 – January 2017
Halifax Biomedical (orthopaedic implant assessment using imaging) Mabou, NS

➢ **Built a framework for the assessment of lumbar spine stability.**
Quantified spinal motion from x-ray images using analysis in Matlab. Model-to-image matching using image processing and feature detection. Implemented >6 global optimization algorithms. Data processing and algorithm evaluation pipelines using parallel computing (pre-CUDA).

➢ **Developed 3D anatomical models for R&D tasks.**
Statistical Shape Models for spine from 110+ CT datasets. Modelling algorithms, including thin-plate splines for point correspondence, principal component analysis for alignment and Poisson Surface reconstruction for surface models. Algorithms to reflect kinematic coupling of joint implants.

➢ **Contributed to all of the company's wider R&D efforts.**
Recruited, supervised and created projects for 2 co-op students per term on a rolling basis. Presented R&D progress to non-technical staff during lunch-and-learns. Participated in IP creation. Motivated redesign image acquisition hardware based on first-principles and ran simulation studies to support it.

Graduate Researcher November 2007 – April 2013
Lawson Health Research Institute London, ON

➢ **Developed new MRI acquisition methods.**
Pulse sequence programming of clinical MRI scanners with Siemens' proprietary development tools C++. Validating and testing using imaging phantoms and humans. Operated MRI scanner. Collaborated with Siemens' academic liaison.

➢ **Conducted brain imaging studies using novel MRI acquisition methods.**
Created analysis pipelines using batch processing and parallel computing. Statistical data analyses, simulations for feasibility studies, reproducibility studies, participant recruitment, scientific presentations.

➢ **Led ancillary projects within the clinical imaging department.**
Developed complete veterinary MRI protocols and performed imaging. Demagnetized a hospital room. Mentored new students. Implemented imaging protocols for other researchers.

Research Assistant January 2006 – August 2006
Centre for Imaging Research and Advanced Materials Characterization Windsor, ON

➢ Fabricated an acoustic, physical model of the human chest, developed custom transducers to mimic clinical percussion, and automated data collection.

EDUCATION

Ph.D. Medical Biophysics (reclassified from M.Sc.) 2007- 2013
Western University London, ON
B.Sc. Physics and High Technology (Honours) 2001- 2006
University of Windsor Windsor, ON

Summary of volunteer experience, interests and side projects happily provided upon request.