François Charette, PhD.

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Web version of this Résumé: https://francoischarette.github.io/bio/

OBJECTIVE

Obtain a position where my Machine Learning/AI expertise, advanced signal processing knowledge, hands-on approach and managerial skills can be applied to the development and deployment of new and innovative technologies and products.

PROFESSIONAL EXPERIENCE

1998 – 2023 *Ford Motor Company* Dearborn, MI/Palo-Alto, CA

- AI/ML Research Scientist (*2015-2023*); Lead research in 1) end-to-end Neural Networks for autonomous vehicle controls, i.e., steering and throttle, 2) developing speech interfaces that use Deep Neural Networks to implement Natural Language Understanding and Automatic Speech Recognition, 3) Sound Source Identifications and 4) Sensors signal processing, e.g., LiDAR, cameras, etc. Also, participated in evaluations of strategic technologies from startups located in the Silicon Valley area and supported recruiting efforts to build a strong team in a very competitive talent landscape.
- SPAVR Research Engineer (*2012-2015*); Team leader of the of the development and implementation of **C**orporate **E**ngineering **T**est **P**rocedure (CETP) for hands-free speech quality processing of vehicle infotainment systems. The ability to do in-house evaluation of hands-free phone quality is a Ford first. This effort resulted in innovative hands-free noise reduction algorithm improvements for in-vehicle speech quality processing. Also, Lead developer of the Ford signal processing and advanced speech recognition toolbox (MATLAB based). This toolbox contains multiple user interfaces that allows to manage, process, and create (1 patent) large number of speech utterances with various background noise levels and types to support the development of speech recognition algorithms and the testing of speech recognition engine. Supported and analyzed all the suppliers' noise suppression software evaluations and used the results to guide the speech processing selection for SYNC Gen III, i.e., QNX.
- S&R Core Engineer (*2009-2011*); Responsible for the development of innovative testing procedures, objective metrics, data acquisition and processing, reporting, etc. for a wide variety of core production programs. Develops and/or adapts objective metrics, methods, and tools for the various requirements of the projects. Performs both road and lab measurements using proving ground and the Hydraulic Road Simulator.
- VSHC Core Engineer (*2007-2008*); Principal developer for the **V**ehicle **S**ensitivity **H**ealth **C**hart tools and infrastructure. Created the first comprehensive implementation of VSHC data management, processing and reporting system that reduces the amount of time to process full VSHC data from days to minutes.
- Closures Lab Leader (*2005-2006*); Plan, schedule, process data and adapt, if needed, all the signal processing/ metrics required for noise and vibration measurements done at the closure's lab. These include in-vehicle microphones and accelerometers instrumentation and measurement made on several harsh road surfaces at various speeds.
- Sound Quality Lab Leader (*2004*); Responsible for the development and implementation of the Sound Quality lab Corporate Engineering Test Procedures (CETP), data processing/acquisition, archiving, and management. Proactively created batch processing software to reduce the time required to process data which reduced the lab turnaround time by at least a factor of five.
- NOMAD Team Leader (*2002-2003*); Led the development and implementation of assembly plant end of line acoustic and vibration analysis/tools/software for NVH/S&R Objective Measurements, Analysis and Diagnostic (i.e., the NOMAD project).
- S&R Core Engineer (*1999-2001*); Principal technical developer for various NVH/S&R tools. Received the prestigious "HENRY FORD TECHNOLOGICAL AWARD" for all the technical contributions in the development of these tools (4 patents + CETP).
- NVH Engineer (*1998-1999*); Lead Buzz, Squeak & Rattle (i.e., BSR) measurements and diagnostics on multiple vehicle programs e.g., sliding wedge rattle, window scrape, side doors, lift gates, door chuck, etc. Developed and implemented new embedded systems/tools for detection and localization of S&R sources, i.e., the "S&R Exciter kit" and the S&R failure detection/prediction of stabilizer bar bushing, (2 patents).

EDUCATION

Research Associate – Post Doctoral Work in Active Control of Sound and vibrations

1996 – 1998 *Virginia Polytechnic Institute and State University* Blacksburg, Virginia

1) Led the development and lab experimentation of an active trim panel for the reduction of separation flow noise in airplane cockpit (NASA Funded project). **2)** Chief developer of various real time controllers (signal processing on DSP boards) with GUI interface, and multiple data acquisition systems for the Vibration and Acoustic Laboratories research group, i.e., VAL. **3)** Led the signal processing development for the noise source separation and identification system in motor vehicles cabin using the Least Mean Square (i.e., LMS) algorithm. **4)** Developed electro-mechanical adaptive vibration absorbers for sound minimization applications. Designed and implemented two different types of tunable vibration absorbers. Planned and executed the numerous lab experiments required to verify and improve these new tunable vibration absorbers. Demonstrated that the greatest sound reduction obtained with a vibration absorber is not necessarily when the absorber is tuned to minimize the vibration. The greatest reduction is obtained using an acoustic cost function which leads to the absorber being detuned.

Ph.D. in Mechanical Engineering

1992 – 1995 *Sherbrooke University* Sherbrooke, QC, Canada

Active Control of Sound Radiation from Plane Structures Using PVDF Volume Displacement Sensors

Innovative volume displacement sensors made of shaped PVDF film strips were developed for beams and plates with arbitrary boundary conditions. Multiple variational models of piezoelectric actuation and PVDF film sensing for beams and plates were developed and experimentally verified. These piezoelectric transducers were implemented in active control systems minimizing the volume displacement of the structure.

Master in Mechanical Engineering

1990 – 1992 *Laval University* Québec, QC, Canada

Bending Energy Dissipation of Simplified Single-Layer Stranded Cable

A simplified single-layer stranded cable model was developed to compute the energy dissipated by friction between strand components. The relative displacement between wire and core was determined according to the theory of contact mechanics. The predicted values were compared to experimental values derived from tests on overhead transmission line conductors in free-field conditions.

Bachelor in Mechanical Engineering

1985 – 1990 *Laval University* Québec, QC, Canada

AWARDS AND SCHOLARSHIP

2022 *AI/ML Award (Visual Path Navigation)*
2020 *AI/ML Award (One-Shot Learning)*
2020 *AI/ML Award (Platooning)*
2019 *R&AE Recognition Award for GWC Program*
2018 *R&AE Recognition Award for GWC Program*
2015 *Global Customer Satisfaction Award*
2013 *I.T. Innovation Contest Award*
2012 *Peer Recognition Award*
2011 *PD Engineering Excellence Award*
2010 *Global Customer Satisfaction Award*
2009 *VE Quality Award*
2007 *Global Customer Satisfaction Award*
2005 *VASE Technical Achievement Award*
2002 *Global Customer Satisfaction Award*
1999 ***Henry Ford Technological Award***
1994-1995 *FCAR Scholarship*
1993 *Sherbrooke University Institutional Scholarship*
1990 through 1992 *FCAR Scholarship*

ADDITIONAL INFORMATION

- **U.S. citizen**, bilingual (English-French).
- Expert in programming Python, MATLAB, and LabVIEW.
- Experienced with various DNN frameworks; TensorFlow with Keras and PyTorch.
- Proficient user of various data acquisition and analysis systems, e.g., LMS TestLab, Head Acoustics (ACQUA and Artemis), National Instruments systems, B&K Equipment, Iotech Wavebook, HP analyzers, etc.

PATENTS AND PUBLICATIONS

20 US Patents (plus 5 others pending), 16 articles/preprints, 20 Tech. Reports, 24 Conferences, 11 workshops and 100 + internal departmental reports and test procedures.