

Eric Métois, Ph.D.

Technology Consultant
(U.S citizen)

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Profile

- Organized and reliable team player with an eye on the big picture and the ability to lead others in a cordial and efficient effort.
- Solid theoretical training in Math, Physics and Electrical Engineering, rounded by a wide range of practical skills.
 - Software development skills include MATLAB, ANSI C, VC++ COM objects, and VB
 - Hardware skills include some basic electronics, experience with early DSP chips and PIC programming
 - Mechanical skills include design, familiarity with basic shop tools, hand tools and a laser cutter
- Proven creativity and problem-solving skills with expertise in Signal Processing, Detection, Estimation and Classification for 1D and 2D signals. Designed, developed and implemented several innovative algorithms for Audio and Images.
- Experienced preparing proposals, papers, presentations and demonstration systems aimed to audiences with varied degrees of technical expertise.
- Familiarity with the patent process, from writing applications to infringement and claims validity argumentation.
- Fast learner experienced with working in multidisciplinary environments with artists, lawyers, business developers, software, hardware and mechanical engineers.

Education

1992-1996: **Massachusetts Institute of Technology** (MIT Media Lab) - Cambridge, MA

Ph.D., 1996

Detection, estimation, information theory, and nonlinear dynamics. Research in *Embedding Modeling* and its application to the analysis, representation and synthesis of musical signals. Motorola fellowship awarded for the year 94/95.

1988-1991: **Ecole Nationale Supérieure des Télécommunications** (ENST) - Paris, France

Masters EE, 1991

Program leading to the State Engineering Degree (Masters). Majored in Signal Processing.

1986-1988: **Lycée Thiers** – Marseille, France

National Preparatory Classes (M')

Program focused on mathematics and physics, preparing for French schools' competitive entrance examinations.

Professional Experience

2003-present: **Freelance Consultant** – Arlington, MA

Independent developer

- SPARTICLE: AN IPHONE GAME (Summer 2009): An original 3D casual iPhone game entirely built from scratch.
- iCHALKY: AN IPHONE APP (Fall 2008): A surprisingly popular iPhone application voted "best kid distraction" iPhone app for 2008 and downloaded over 300,000 times in 12 months. Ported to the Android platform in early 2010.
- DIGITAL AUDIO WATERMARK (Fall 2006): Design, development and implementation of audio watermarking utilities that embed and retrieve a short data payload within and from audio wav files - Available as shareware.
- 1D BARCODE DECODING FROM IMAGES (Fall 2004): Design, development and implementation of a series of image processing algorithms aiming to read optical scans of 1D barcodes despite potentially crude image resolution - Available as shareware.

Technology consultant

- VU.IT: A SMART PARCEL INDUCTION DEVICE (**Postea, Inc** – 2007-08): Research and development effort leading to two working prototypes of a smart scale device that determines a parcel's weight, 3D dimensions, performs OCR address and barcode parsing in a single step.
- 3D OPTICAL TRACKING (**Oblong Industries, Inc** – 2006 - present): Design, development and implementation of a fast and accurate system that locates known tags from a plurality of IR cameras with 6 degrees of freedom.
- FRAUD AND ABUSE DETECTION IN GRAPHICS (**MarkMonitor Inc.** – Spring 2005): Design, development and implementation of a graphics recognition engine capable of locating and recognizing known "toxic" graphical objects such as words or logos within arbitrary image data.
- TRANSACTION RISK / ACTUARIAL MODEL (**Escher Group Ltd.** – Fall 2004): Means for an organization to infer its own actuarial model from its past activity so that it may decide whether or not to incur the variable cost associated with risk control when facing a new transaction request.
- NIKE OPTICAL CODING SCHEME (**Nike, Inc.** - Spring 2004): Design of a proprietary graphic symbology conveying a unique identifier and applicable to a wide variety of products. Design, development and implementation of algorithms aiming to retrieve these identifiers using commercial grade optical scanner such as a webcam, coping with a range of geometrical distortions.
- SOFTWARE DEVELOPMENT (**BlackDust Design, LLC.** - Spring 2004): This software, developed in Visual Basic .NET, serves as the front end of an interactive sensing module for laparoscopic skill training and measurement (LTS 2000).
- "EYETOY:ANTIGRAV" MACHINE VISION / TRACKING SYSTEM (**Harmonix Music Systems, Inc.** - Winter 2003-2004): Development and implementation of a vision system in the context of a Sony PlayStation/2 video game that uses a player's physical gestures and postures as character controls. The game won the Best of E3 2004 IGN.com Award in the "Most Innovative Design" category and was nominated for the Best of E3 2004 Game Critics Award in the "Best Puzzle/Trivia/Parlor Game" category. It subsequently ranked No.4 in the Today Show's 2004 "Top Video Games" toy contest.
- MUSICAL TRANSIENTS DETECTION AND CLASSIFICATION (**Harmonix Music Systems, Inc.** - 2003, 06,07): Research and development of a means to detect, locate and characterize musical transients from an arbitrary audio stream. The resulting algorithms were integrated within Apple's iTunes for an iPod game entitled "PHASE" and released in the fall 2007.

2000-2003: **Escher Group Ltd.** - Cambridge, MA

Director of Strategic Research

- Contribution and improvements to FiberFingerprinting® algorithms and implementation. Design and implementation of various image registration algorithms. Numerical and theoretical performance evaluations.
- Invention and implementations of a novel and versatile patent pending printed symbology / image watermark.
- Design and development of numerous proofs of principles and demonstration systems.
- Analysis of customer's emerging needs, notably for business intelligence, analytics, data mining and CRM.

1997-2000: **Verance Corporation** (formerly **ARIS Technologies, Inc.**) - Cambridge, MA

Research Staff Engineer

Among the first research staff members at an early startup stage.

- Co-inventor of *MusiCode*®, Verance's core audio watermarking technology, which was selected as the worldwide industry standard for DVD Audio copy control and for the Secure Digital Music Initiative (SDMI) in 1999. The technology is at the center of the company's *ConfirMedia*™ offering, which currently monitors the 100 top U.S. media markets plus all major TV and Cable networks, reaching 85% of the U.S. viewing and listening audience.
- Responsibilities included research contributions, proposals, presentations, public relations throughout the music industry and the company's contributions to SDMI.

1992-1996: **MIT Media Laboratory**. - Cambridge, MA

Research Assistant

- Contribution to the design and development of various interactive musical systems (HyperInstruments, BrainOpera) in Prof. Machover's Music and Media group.
- Design and development of a variety of real-time audio signal processing algorithms.
- Ph.D. research led to *Cluster-Based Embedding Modeling*, a patented approach to the inference of non-linear dynamical systems from the observation of time series.
- Ph.D. dissertation, *Musical Sound Information - Musical gestures and embedding synthesis*, investigated means of applying these principles to the inference of dynamical sound synthesis algorithms from recorded waveforms.

1991-1992: **Centre d'Etude et de Recherche des Télécommunications** - Toulon, France

Scientific Consultant

Mandatory military service as a consultant to the French navy. Performance analysis of an RF air/sea communication device.

1990-1991: **Center for New Music and Audio Technology** (CNMAT) - U.C. Berkeley, CA

Junior Research Specialist

Research internship under the direction of Prof. David Wessel. Investigation of original sound effects and their real-time implementation.

Independent Projects

2000: **Popular Audio Player Visualization: The SticksterZ**

Independent work performed out of curiosity

Dancing stick figures for Real Networks and Windows Media Players. 3D rendering and dynamics written from scratch (ANSI C). Excess of 40,000 estimated downloads.

1998: **Musical Gesture and Audio Effects Processing**

Independent research presented at the first annual Digital Audio Effects conference (DAFX98)

Harmonic structure likelihood analysis coupled with simple wave-table audio synthesis as an illustration that even a difficult problem such as real-time polyphonic tracking can be reasonably achieved with a soft analysis/control system which doesn't attempt to capture high level musical intentions but rather confines itself to an expressive and humble set of measurements.

Publications

Papers

- E. Métois, P. Yarin, N. Salzman, J.R. Smith - *FiberFingerprint Identification* - AutoID'02 proceedings, Tarrytown NY, 2002.
- R. Petrovic, J.M. Winograd, K. Jemili, E. Métois - *Data Hiding within Audio Signals* - Facta Universitatis (NIS), Series: Electronics and Energetics vol.12, No.2 (1999), pp.103-122.
- N. Gershenfeld, B. Schöner, E. Métois - *Cluster-Weighted-Modeling for Time Series Analysis* - Letter to Nature vol. 397 no. 6717, 1999.
- E. Métois. *Musical Gestures and Audio Effects Processing* - DAFX98 proceedings, Barcelona, 1998.
- E. Métois. *Musical Sound Information - Musical Gestures and Embedding Synthesis* - Ph.D. dissertation, MIT Media Laboratory, 1996.

Patents

- E. Métois, J.R. Smith, P.M. Yarin - *Data encoding and workpiece authentication using halftone information* - Pending.
- E. Métois - *System and method for encoding and decoding data and position information using angular symbology and beacons* - Pending.
- J.R. Smith, E. Métois, M.J. Murphy - *System and method for authentication and tracking of a workpiece that includes an optically active medium* - Pending.
- E. Métois, J.R. Smith - *Data encoding and decoding using angular symbology* - Pending.
- J.R. Smith, P.M. Yarin, M.J. Murphy, A.V. Sutherland, E. Métois - *Personal mail piece tracing and tracking mechanism* - Pending.
- J.R. Smith, E. Métois, P.M. Yarin, M.J. Murphy, A.V. Sutherland - *Associating electronic data with physical objects* - Pending.
- E. Métois, R. Petrovic, K. Jemili - *Method and apparatus for detecting processing stages applied to a signal* - Issued May 16, 2006 (US 7,046,808).
- R. Petrovic, K. Jemili, J.M. Winograd, E. Métois - *Apparatus and method for embedding and extracting information in analog signals using distributed signal features* - Issued Jan 16, 2001 (US 6,175,627).
- J.M. Winograd, R. Petrovic, E. Métois, K. Jemili - *Method and apparatus for preventing removal of embedded information in cover signals* - Issued Nov 7, 2000 (US 6,145,081).
- N. Gershenfeld, B. Schöner, E. Métois - *Efficient Synthesis of Complex, Driven Systems* - Issued Dec 14, 1999 (US 6,000,833).
- R. Petrovic, J.M. Winograd, K. Jemili, E. Métois - *Apparatus and method for encoding and decoding information in analog signals* - Issued Aug 17, 1999 (US 5,940,135).

Further detailed information about my work is available online at <http://www.metois.com>

References available upon request