

## Frederic F. LEYMARIE

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### EDUCATION

**Brown University** / Division of Engineering / Providence, RI, USA

- Ph.D. thesis on “Three-Dimensional Shape Representation via Shock Flows,” May 2003.
- Awards: IBM PhD Fellowship, Sigma Xi Outstanding Research.

**McGill University** / Electrical Engineering / Montreal, Canada / 1990

- Master’s of Engineering: thesis in biomedical imagery on “Tracking and Describing Deformable Objects Using an Active Contour Model.”
- Award: Fellowship of the Natural Sciences and Engineering Research Council of Canada.

**Polytechnic School of Montreal** / Electrical Engineering / Canada / 1986

- Bachelor of Engineering: GPA: 3.83/4; honors in aeronautics; internship at Canadair, Inc.

### PROFESSIONAL EXPERIENCE

**Manager** : The SHAPE Lab. / Brown University / 2003-present

- Co-author of a second successful proposal to the National Science Foundation (NSF); funding of 2+ million USD over 4 years; see [www.lems.brown.edu/shape/](http://www.lems.brown.edu/shape/) .

**R&D Project Leader and Researcher** : The SHAPE Lab. / Brown University / 1998-present

- Initiated a successful proposal to the NSF establishing the SHAPE lab. (\$1.5 million over 3 years).
- Developed a research plan in pattern analysis (see [www.lems.brown.edu/vision/researchAreas/Shocks3D/](http://www.lems.brown.edu/vision/researchAreas/Shocks3D/) ).  
Invented and implemented algorithms based on computational geometry, optimization techniques, and multi-scale data analysis, with applications to object modeling and virtual reality systems (patent pending).

**Project Manager**: Syseca (now Thales) / Thomson-CSF, Inc. / Paris, France / 1994-98

- Managed French and European projects (2 to 10 people) in the fields of Geography, Multimodal interfaces, Technology transfer, Environmental Emergency Management Systems.
- Performed client reporting and negotiations, budget bookkeeping, proposal and report writing and presentations, software design, as well as business development activities.
- Managed the REALISE consortium — 4 R&D teams in 3 countries (France, Germany, Netherlands) — funded by the European Commission (ESPRIT Project #8788); offshoot of this project: [www.realviz.com](http://www.realviz.com).
- Built a European consortium to prepare a proposal on the digital cities of the future (CyberCity).

### SKILLS

**Written/Oral skills**: Authored and presented (20+) papers at professional international conferences. First author of technical peer-reviewed journal papers. Reviewer (past 3 years) for the IEEE Trans. on PAMI, ACM’s Solid Model. & App., Siggraph, and Jour. of CISE, SPIE’s Jour. of EI, and Kluwer’s Acta AM.

**Business and Leadership Experience**:

- Founding member of the Brown University Biotech Interest Group, 2002-3.
- Participated in the Brown Entrepreneurship program in 1999. Co-wrote two business plans on “electronic content publishing,” and “investment clubs on the internet.”

**Programming/Computing**: Advanced computational programming (cellular automata, geometry, image processing, numerical analysis, optimization, statistics), mainly in the C language. Also experienced in Lisp (expert systems), C++ (graphics), Fortran, Matlab/Maple/Mathematica.

**Languages**: Bilingual French - English. Elementary Spanish and German.

## SELECTED PUBLICATIONS

1. F. F. Leymarie and B. B. Kimia, "Computation of the Shock Scaffold for Unorganized Point Clouds in 3D," IEEE Proc. of the Conference on Computer Vision and Pattern Recognition (CVPR), June 2003.
2. Frederic Fol Leymarie, "Three-Dimensional Shape Representation via Shock Flows," PhD thesis, Brown U., May 2003.
3. F. F. Leymarie and B. B. Kimia, US patent pending: "Method and apparatus for multi-dimensional shape representation via shock flows."
4. D. B. Cooper *et al.*, "Bayesian Virtual Pot-Assembly from Fragments as Problems in Perceptual-Grouping and Geometric Learning." IEEE Proc. of the International Conference on Pattern Recognition (ICPR), vol.III, pp.297-302, August 2002.
5. B. Kimia and F. Leymarie, "Symmetry-based Representation of Volumetric Imaging," invited paper at the IEEE International Conference on Image Processing (ICIP), vol. 2, pp. 581-584, October 2001.
6. D. B. Cooper *et al.*, "Assembling Virtual Pots from 3D Measurements of their Fragments." ACM Siggraph publ., Proc. of VAST 2001: Virtual Reality, Archeology, and Cultural Heritage, pp. 241-253.
7. F. Leymarie and B. Kimia, "The Shock Scaffold for Representing 3D Shape," Lecture Notes in Computer Science (2059), Springer-Verlag, pp.216-228, 2001.
8. F. Leymarie *et al.*, "The SHAPE Lab. - New Technology and Software for Archaeologists," in *Computing Archaeology for Understanding the Past*, pp. 79-90, BAR International Series 931, Archaeopress, UK, 2001.
9. F. Leymarie and B. Kimia, "Discrete 3D Wave Propagation," Computational Imaging & Vision Series, vol.18, pp.351-360, Kluwer Academic, June 2000.
10. H. Tek, F. Leymarie and B. Kimia, "Interpenetrating Waves and Multiple Generation Shocks via the CEDT," In "Advances in Visual Form Analysis," World Scientific, pp. 582-593, 1997.
11. F.Leymarie, "Exploitation of 3D Georeferenced Datasets in a GIS," Internat. Wksh. on the "Exploitation of Multimedia Databases," European Commission, n EUR 17349 EN, pp.10-29, March 1997.
12. F.Leymarie *et al.*, "REALISE: Reconstruction of Reality from Image Sequences," IEEE Proc. of ICIP, Vol.3, pp.651-654, Lausanne, Switzerland, Sept. 1996.
13. F.Leymarie *et al.*, "Towards the Automation of Road Extraction Processes," vol. SPIE-2960, pp.84-95, Sept. 1996.
14. F.Leymarie and D.van Rooy, "EEMS: Environmental Emergency Management Systems in a European context," Proc. of HAZARDS-96, pp.21-23, Toronto, Canada, July. 1996.
15. F.Leymarie and M.D.Levine, "Tracking Deformable Objects in the Plane Using an Active Contour Model," IEEE Trans. on Pattern Analysis & Machine Intelligence, Vol.15(6), pp. 617-634, June 1993.
16. F.Leymarie and M.D.Levine, "Simulating the Grassfire Transform Using an Active Contour Model," IEEE Trans. on Pattern Analysis & Machine Intelligence, Vol.14(1), pp. 56-75, Jan. 1992.
17. F.Leymarie and M.D.Levine, "Fast Raster Scan Distance Propagation on the Discrete Rectangular Lattice," Computer Vision, Graphics & Image Processing – Image Understanding, Vol.55(1), pp. 84-94, Jan. 1992. Academic Press.

## RECENT INVITED TALKS

- "The Shock Scaffold," presented at the MittleEuropa Foundation, Bolzano, Italy, Sept. 2002, at the MIT, to the Design Lab. group, Dec. 2001, at Princeton University, to the Computer Graphics Group, April 2001, and at the ETH, Zurich, Switzerland, to the Computer Vision Group (also presented "Virtual Reality and Archaeology"), May 2001.
- "Shape," presented in Barcelona, Spain, at the Computer Vision Center (CVC), for the 2nd Catalan Day on Images and Computations; keynote speaker; Dec. 15, 2000.
- "Vision Research at Brown," Kolloquium Digitale Visuelle Information, Tech. University of Graz, Austria, Sept. 1998.
- "Applications of Virtual Reality: CyberMonument and CyberCity" (with M. Gruber), 3rd European Digital Cities Conference, Berlin, Germany; invited by the European Commission; Dec. 1997.

## ADDITIONAL INFORMATION

**Consulting/Expertise:** Reviewer at the European Commission for the ESPRIT "HPCN" and "IAI" Calls for proposals of Spring and Fall 1997. Conducted research on Environmental Emergency Management Systems in Europe (for the European Commission, DGXIII, 1995).

**Professional societies:** Member of the IEEE, ACM and Sigma Xi.