

Kevin Loquin

Doctor

145 Rue de la Constituante,
34000 Montpellier, France.
00 33 6 64 10 81 46
00 33 4 67 41 85 64
<http://www.lirmm.fr/~loquin>
Kevin.Loquin@lirmm.fr

OBJECTIVE

Postdoctoral position

EDUCATIONAL & RESEARCH BACKGROUND

2005-2008. PhD research project "*On the use of maxitive kernels in information processing*".

Lirmm, Montpellier, France.

Defense: November 3rd 2008.

Jury members:

Isabelle BLOCH
Didier DUBOIS
Valérie BERTHÉ
G rard BIAU
Olivier STRAUSS

Professor ENST (Paris)
CNRS Researcher IRIT (Toulouse)
CNRS Researcher LIRMM (Montpellier)
Professor UPMC (Paris)
Associate Professor LIRMM (Montpellier)

In this thesis, we propose and develop new methods in statistics and in signal and image processing based upon possibility theory. These new methods are adapted from usual data processing tools. They aim at handling the defects of the usual methods coming from the user's lack of knowledge in the modeling of the observed phenomenon. The precise, punctual outputs of the usual methods become interval, hence imprecise, outputs. The interval outputs thus obtained consistently reflect the arbitrariness in the choice of the parameters of the usual methods.

Many algorithms in signal processing and in statistics use, more or less explicitly, the expectation operator associated to a probabilistic representation of the neighborhood of a point, which we call summative kernel. Thus, we group many data processing methods together under the name of summative extraction of information. Among these methods, there are measure modeling, linear filtering, sampling, interpolation and derivation processes of digital signals, probability density and cumulative distribution functions estimators...

As an alternative to the summative extraction method, we present the maxitive extraction of information that uses the Choquet integral operator associated to a possibilistic representation of the neighborhood of a point, which we call maxitive kernel. The lack of knowledge on the summative kernel is handled by the fact that a maxitive kernel encodes a family of summative kernels. Moreover, the interval output of the maxitive extraction method is the set of the punctual outputs of the summative extraction methods obtained with the summative kernels encoded by the chosen maxitive kernel. On top of this theoretical justification, we present a series of applications of the maxitive extraction method in statistics and signal processing, which constitutes a toolbox, left to be enriched and used on real cases.

2004-2005. Master of Science in applied fundamental mathematics "*Stochastic processes and statistics for derivatives pricing model*"

University of Rouen, France.

Coursework: Asymptotic statistics, Operators, Markov processes and chains, Sobolev spaces, Finance and stochastic processes, Orthogonal polynomials, Young measures...

2000-2005. Master of Engineering in mathematical engineering

INSA Rouen, France.

Coursework: Java, Fortran, C/C++ programming, Numerical analysis, Measure, Distribution and Integration theories, Probability theory in the measure-theoretic framework, Signal processing...

PROFESSIONAL EXPERIENCE

Summer '04. development of an N-tiers J2EE application for documents' formatting.

WorkIT, Paris, France.

Summer '03. development of a Linux distribution.

TRANSICIEL, Paris, France.

ORGANIZATIONAL ACTIVITIES

I was the local organization correspondent and a scientific organization consultant of the third SIPTA summer school (<http://www.lirmm.fr/SIPTASchool08>) on imprecise probability in Montpellier from July, 2nd to July, 8th 2008. This international school was labeled "European Summer School" by the French government. 30 participants from worldwide attended to lectures from international researchers like Didier Dubois, Gert de Cooman, Fabrizio Ruggeri, Glenn

Shafer, Enrique Miranda, Fabio Cozman, Cassio Polpo de Campos and Jean-Marc Bernard.

REVIEWING

I have been a reviewer of two articles for the SMPS'08 conference in Toulouse and one article for the journal: *Computers and Mathematics with Applications*

COURSES

Fall 2005: Signal processing (M1 EEA University Montpellier II).
Spring 2006: Computer sciences for beginners (University Montpellier III).
Fall 2006: C programming (L2 STPI University Montpellier II).
Fall 2007: Computer sciences for beginners (University Montpellier III).

PUBLICATIONS

INTERNATIONAL JOURNALS

1. Kevin Loquin and Olivier Strauss, "*Histogram density estimators based upon a fuzzy partition*", *Statistics & Probability Letters*, 78(13):1863-1868, Septembre 2008.
2. Kevin Loquin and Olivier Strauss, "*On the granularity of summative kernels*", *Fuzzy Sets and Systems, From Knowledge Representation to Information Processing and Management - Selected papers from the French Fuzzy Days (LFA 2006)*, 2008, 159, 1952-1972.

INTERNATIONAL CONFERENCES

3. Kevin Loquin and Olivier Strauss "*Fuzzy histograms and density estimation*", *SMPS'06 Soft Methods in Probability and Statistics*, Bristol, UK, Lawry, Miranda, Bugarin, Li, Gil, Grzegorzewski, Hryniewicz Eds, Springer, pp. 45-52, September 5-7, 2006.
4. Florence Jacquy, Kevin Loquin, Frédéric Comby and Olivier Strauss "*Non-additive approach for gradient-based edge detection*", *ICIP'07 International Conference on Image Processing*, San Antonio, Texas, USA, Vol.III, pp 49-52, September 16-19, 2007.
5. Kevin Loquin and Olivier Strauss "*Imprecise functional estimation: the cumulative distribution case*", *SMPS'08 Soft Methods in Probability and Statistics*, Toulouse, France, pp 175-182, September 8-10, 2008.
6. Kevin Loquin and Olivier Strauss "*Noise quantization via maxitive kernel based filtering*", In: *IEEE Computer Society Conference on Computer Vision and Pattern Recognition 2009 (CVPR'09)*. SUBMITTED.

NATIONAL CONFERENCES (FRENCH)

7. Kevin Loquin and Olivier Strauss "*De la granulosité des noyaux d'échantillonnage*", In: *Rencontres francophones sur la Logique Floue et ses Applications 2006 (LFA'06)*, Cépaduès eds, pp. 387-394.
8. Olivier Strauss and Kevin Loquin "*Vers une approche unifiée du filtrage des images*", In: *Rencontres francophones sur la Logique Floue et ses Applications 2007 (LFA'07)*, Cépaduès eds, pp. 41-48.
9. Bilal Nehme, Kevin Loquin and Olivier Strauss "*Estimation Imprécise de la densité de probabilité*", In: *Rencontres francophones sur la Logique Floue et ses Applications 2008 (LFA'08)*, Cépaduès eds, pp. 286-293.