

Andrés Romero

PhD computer vision and parallel architectures

About

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🐦 andresrommier
🌐 andresromero
in romeromier

Languages

Full working proficiency in
spanish, english and french

Programming/ architectures

C and C++ (12+ years),
Matlab (8+ years), Python
(4+ years), PHP (4+ years),
Javascript, **L^AT_EX**

OpenMP, SIMD (SSE, AVX,
Neon and AltiVec)

Notions of data science and
massive data mining using
MapReduce (Hadoop) and R

TI C6000 and C5000
Panda boards, Raspberry
PI's and Intel ULV platforms

Operating systems

Strong Linux/Unix skills, Mac
OS X, Windows

🧪 Interests

I am lecturer and researcher from the **Parallel Systems team** at the Laboratoire de Recherche en Informatique from Paris Sud University XI, where I work on the **design**, **acceleration** and **implementation** of **computer vision** algorithms.

The key goal of my research is to develop high performance algorithms for **visual object detection**, **tracking** and **texture description** for real-world problems. The algorithms I have worked with require comprehensive understanding of a broad set of domains: **machine learning**, **software engineering**, **computer architecture** and **statistics**.

In total, I have more than 8 years of research experience working with signal and image processing algorithms in embedded architectures. I am familiar with **ARM architectures** (ARM Cortex A9 and A15) and the **Texas Instruments C6000 DSP** family. On those platforms I have implemented many image, voice and audio processing algorithms. During my PhD I worked on the acceleration of computer vision algorithms on desktop and embedded platforms using **OpenMP** and **SIMD** instructions sets (SSE, Neon and AltiVec).

Other fields of interest to me are **data science**, **natural language processing** (NLP), **data mining**, **information theory**, **complexity theory** and **cybernetics**.

📖 Education

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|-----------|--|--|
| 2010-2013 | Ph.D. in Computer Science | Laboratoire de Recherche en Informatique, Université Paris Sud |
| | Advisors: Lionel Lacassagne and Michèle Gouiffès | |
| | Real-time multi-target tracking: A study on color-texture covariance matrices and descriptor/operator switching. | |
| | The results of this work were considered for the ITEA/Spy european project . | |
| 2006-2008 | M.Sc. Signal Processing | Instituto Politécnico Nacional (IPN) |
| | Advisors: Héctor Pérez Meana and Mariko Nakano Miyatake | |
| | Subject: Acoustic active noise controllers in TMS320C6713DSK platforms. | |
| 2000-2005 | Telecommunications Engineering | Universidad Nacional Autónoma de México (UNAM) |
| | Advisor: Bohumil Psenicka | |
| | Graduation project: Acoustic active noise cancellation. | |
| 2000 | High-school | Centro Universitario México, Mexico City |
| | Specialization in mathematics and physics | |

👛 Experience

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| 2013-2014 | Université Paris Sud, Orsay Faculty of Sciences | Invited researcher and teacher |
| | Research work: Covariance descriptor algorithm implementation on "Many-core" architectures (Xeon-Phi) | |
| 2012-2013 | ITEA/Spy European Project | R&D engineer |
| | Tracking and pedestrian re-identification module, project in collaboration between CASSIDIAN, EOLAN, ENSTA and IEF | |
| 2009 | Minalum de México S.A. de C.V. | R&D engineer |
| | Controller development for a brushless DC motor using PIC's | |
| 2009 | Czech Technical University in Prague, Czech Republic | Visiting Student |
| | Hosted by Prof. Pavel Saradnik | |

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2007-2009

Computer security department, DGSCA, UNAM

Emergency response team (CERT) system development.

Software engineer

2006-2007

Qualcomm, Omnitracs, Mexico City, Mexico

Satellite and GPS surveillance system operator

Operations engineer

2004

Electoral Institute of Oaxaca, Oaxaca, Mexico

Pre-electoral results system for the 2004 governor and local congress elections

Software engineer

Teaching experience

2013-2014

ATER (Invited researcher and teacher)

Université Paris-Sud, France

Courses:

- SIMD instructions for image processing,
- On-line data representations (XML, DOM, XPath, XSLT),
- Relational data bases (SQL),
- Advanced C programming,
- Logical component and computer architecture,
- Scilab.

2012-2013

Laboratory teacher

Université Paris-Sud, France

Courses: SIMD instructions for image processing.

2005-2008

Laboratory teacher

Universidad Nacional Autónoma de México, Mexico

Courses:

- Digital signal processing algorithm implementations on DSP architectures,
- Digital and analog filtering.

Publications

Articles in peer-reviewed journals

Color tracking with contextual switching: Real-time implementation on CPU

F. Laguzet, A. Romero Mier y Terán, M. Gouiffès, L. Lacassagne

Journal of Real Time Image Processing (JRTIP) Special Issue on Real-Time Color Image Processing (2013). Springer, 2013

H, Perez-Meana, A Hybrid Noise Canceling Structure with Secondary Path Estimation

A. Romero, M. Nakano-Miyatake

WSEAS Recent Advances in Systems, Communications and Computers (2008) pp. 194–199. 2008

International peer-reviewed conferences/proceedings

Total Bregman Divergence for Multiple Object Tracking.

A. Romero, M. Gouiffès, L. Lacassagne

IEEE, International Conference on Image Processing (ICIP), 2013

Real-time covariance tracking algorithm for embedded systems

A. Romero Mier y Terán, L. Lacassagne, A. Hassan Zahraee, M. Gouiffès

Conference on Design & Architectures for Signal & Image Processing (DASIP) proceedings. 2013

Enhanced Local Binary Covariance Matrices ELBCM for texture analysis and object tracking

A. Romero, M. Gouiffès, L. Lacassagne

MIRAGE 2013, Berlin, Germany. ACM International Conference Proceedings Series, 2013

Covariance Descriptor Multiple Object Tracking and Re-Identification with Colorspace Evaluation

A. Romero, M. Gouiffès, L. Lacassagne

ACCV 2012 Workshops, Part II, LNCS 7729 proceedings, 2012

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Feature points tracking adaptive to saturation

A. Romero, M. Gouiffès, L. Lacassagne

Signal and Image Processing Applications (ICSIPA), 2011 IEEE International Conference on, 2011

Synthesis of the Low-pass and High-pass Wave Digital Filters

B. Psenicka, Francisco J. García-Ugalde, A. Romero Mier Terán

ICINCO-SPSMC, 2008

Synthesis of digital structure by matrix method

B. Psenicka, F.G. Ugalde, L.E. Salguero, A. Romero

Proceedings of the 7th IASTED International Conference on Signal and Image Processing, 2005

References

Lionel Lacassagne, Associate Professor (MCF HDR)

Laboratoire de Recherche en Informatique (LRI) Université Paris Sud

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Michèle Gouiffès, Enseignant Chercheur

Laboratoire d'Informatique pour la Mécanique et les Sciences de l'Ingénieur

Université Paris Sud

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Rubén Aquino Luna,

Information Security Sub-director, DGTIC, UNAM

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Bohumil Psenicka, Full-time definite C-level Professor

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