

Mabel Iglesias Ham,

MSc Computer Science

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CURRENT POSITION:

Since September 2012 -
Expected for Sept 2016

PhD Student at IST Austria
Supervised by Prof. Herbert Edelsbrunner – [edels\(at\)ist.ac.at](mailto:edels(at)ist.ac.at)

RESEARCH INTERESTS:

Geometry: Sphere Packing and Covering, Delaunay/Voronoi Diagrams,
Order-k Alpha Complexes, Lattices...
Topology: Persistence, Pockets...

POST GRADUATE TRAINING

2005/ 2011

Advanced Technologies Application Center (CENATAV), Havana, Cuba
Associated Researcher / Pattern Recognition Department
Report to Dr. Edel B. Garcia Reyes – [egarcia\(at\)cenatav.co.cu](mailto:egarcia(at)cenatav.co.cu)

April 2009 - Sept 2009
Jan 2008 - May 2008

Vienna University of Technology, Pattern Recognition and Image Processing
Group (PRIP)
Research Assistant in Project TWIST-CV
Report to O.Univ.Prof. Dr. Walter G. Kropatsch– [krw\(at\)prip.tuwien.ac.at](mailto:krw(at)prip.tuwien.ac.at)

EDUCATION

2000/2005

University of Havana, Cuba
Degree in Computer Science (MSc)

1997/2000

Vocational Pre-University Institute of Exact Sciences “Vladimir Ilich Lenin”
(IPVCE), Cuba
Undergraduate Program (Bachelor, from 10th-12th scholar years)

CERTIFICATIONS

2010

Faculty of Foreign Languages, University of Havana
English (requirement for second Research Category and PhD level)

2010

Institute of Philosophy, Cuba
Social Problems of Science (requirement for second Research
Category and PhD level)

SCIENTIFIC ASSOCIATIONS

2005

Cuban Association of Pattern Recognition

2005

International Association in Pattern Recognition (IAPR)

CONFERENCES AND INVITED TALKS

- 2005 (*paper-attendance*) X Iberoamerican Congress on Pattern Recognition, CIARP, Cuba
- 2005 (*attendance*) III National Congress of Pattern Recognition, RECPAT, Havana, Cuba
- 2005 (*paper - speaker*) I Scientific Conference held on University of Computer Science (UCIENCIA), II Workshop on Image Processing and Applied Signals, Cuba
- 2005 (*2 papers*) IV Scientific Meeting of DICC, Cuba
- 2006 (*paper- attendance*) IV National Congress of Pattern Recognition RECPAT, Cuba
- 2007 (*paper - speaker*) XII Iberoamerican Congress on Pattern Recognition, Chile, CIARP
- 2007 (*paper - speaker*) V National Congress of Pattern Recognition RECPAT, Cuba
- 2008 (*attendance*) Interproject Workshop on Structural Representations in Video SRV08, Soboth, Austria
- 2008 (*paper- attendance*) Computer Vision Winter Workshop, CVWW2008, Slovenija
- 2008 (*paper*) Workshop on Computational Topology in Image Context, CTIC, France
- 2008 (*poster - speaker*) XIII Iberoamerican Congress on Pattern Recognition, CIARP, Cuba.
- 2009 (*paper- attendance*) International Workshop on Graph-Based Representations in Pattern Recognition, GbR2009, Venice, Italy.
- 2009 (*paper - speaker*) Workshop on Computational Topology in Image Context, CTIC, Austria.
- 2010 (*paper*) Workshop on Computational Topology in Image Context, CTIC, Spain.
- 2013 (*attendance*) 17th IAPR International Conference on Discrete Geometry for Computer Imagery, DGCI, March, Seville, Spain.
- 2013 (*attendance*) 9th IAPR TC15 Workshop on Graph-based Representations in Pattern Recognition, GbR, May, Vienna, Austria.
- 2013 (*attendance*) International Conference "Geometry, Topology, and Applications", September, Yaroslavl State University, Russia.
- 2013 (*attendance*) Second ERC "SDModels" Workshop, Delaunay Geometry: Polytopes, Triangulations and Spheres, October, Freie Universität Berlin, Germany.
- 2013 (*Invited talk*) Noon seminar of the Algorithms and Complexity Department, Max Planck Institute for Informatics, Saarbrücken, Germany.

2014 (*attendance*) The 30th Annual Symposium on Computational Geometry, SoCG 2014, Kyoto, Japan.

COURSES

21/11/2005 – 25/11/2005 Analysis, Representation and Learning Techniques based on the Graph Theory, CENATAV, CUBA (by Prof. Edwin Hancock, York, UK)

10/11/2005 – 12/11/2005 Structural and Syntactic Recognition Techniques to the Image Processing and Analysis, CENATAV, CUBA (by Prof. Alberto Sanfeliú, UPC, Spain)

Nov 2005 Video Segmentation, Semantic Annotation and Transcoding (Tutorial by Prof. Alberto del Bimbo in X CIARP 2005).

Nov 2005 Feature Selection and Extraction (Tutorial by Prof. Josef Kittler in X CIARP 2005).

6/1/06 – 13/1/06 Data Mining, CENATAV, CUBA (by Profs. Glenn Maples and Vijay Raghavan, Louisiana University, EUA)

6/2/2006 – 3/3/2006 Machine Learning, CENATAV, CUBA (by Prof. Héctor Allende, Chile)

27/9/2005 – 20/3/2006 Statistical Pattern Recognition, CENATAV, CUBA (by Prof. Rolando José Biscay Lirio)

19/3/2007 – 23/3/2007 Pattern Recognition, CUBA (by Prof. Fred Hamprecht, Heidelberg, Germany)

22/4/2008 – 30/4/2008 Selected Chapters in Image Processing. Extracting Topological Information of 3D Digital Images, Vienna University of Technology (by Prof. Rocío Glez, Univ. of Seville)

4/5/2009 – 11/5/2009 Computing "holes" of 3D digital objects, Vienna University of Technology (by Prof. Pedro Real Jurado, Univ. of Seville)

15/9/2012 – 9/7/2013 Courses from PhD Grad School Program IST Austria: *Linear Algebra, Molecular Cell Biology, Neuroscience I, Algorithms I, Cryptography, Computational Geometry and Topology, Differential Equations, Introduction to Research, Scientific Presentation and Conduct*

22/7/2013 – 2/8/2013 Summer School on Discrete and Computational Geometry, Yaroslavl, Russia.

TEACHING EXPERIENCE

2006 Advisor of the Computer Science thesis entitled "Graph Kernel Function Applied to Fingerprint Matching", Yilian Bazán Pereira.

2005-2007 Advisor of the Computer Science thesis titled "Fingerprint Matching Algorithm Based on the Ridges Correspondences", José Antonio Leyva.

2006-2007 Math contests preparation to technical college students

PUBLICATIONS

Edel García Reyes, José Luis Gil Rodríguez and Mabel Iglesias Ham: “An Automatic Goodness Index to Measure Fingerprint Minutiae Quality”, Lecture Notes in Computer Science, (LNCS 3773), pp. 578 – 585, ISBN 3-540-29850-9, Springer-Verlag Berlin Heidelberg, 2005.

Mabel Iglesias, Yilian Bazán and Edel García: “A Multiple Substructure Matching Algorithm for Fingerprint Verification”, Lecture Notes in Computer Science, (LNCS 4756), pp. 172 – 181, ISBN 978-3-540-76724-4, Springer-Verlag Berlin Heidelberg, 2007.

Mabel Iglesias, Yilian Bazán and Edel García, “A Multiple Substructure Matching Algorithm for Fingerprint Recognition”, isbn 978-959-286-006-3, RECPAT’2007.

Salvador Buenaventura Lopez Marmol, Nicole Maria Artner, Mabel Iglesias, Walter G. Kropatsch, Markus Clabian, y Wilhelm Burger: “Improving Tracking Using Structure”. In Janez Perčs, editor, Proceedings of the 13th. Computer Vision Winter Workshop, pages 69–78, Moravske Toplice, Slovenia, February 2008. Slovenian Pattern Recognition Society, CVWW08, ISBN 978-961-90901-4-5, (2008).

Rocío Gonzalez-Diaz, Mabel Iglesias-Ham, Adrian Ion, Walter G. Kropatsch, Irregular Graph Pyramids, Integral Operators and Representative Cocycles of Cohomology Generators, In Sylvie Alayranges, Guillaume Damiand, Laurent Fuchs, and Pascal Lienhardt, editors, Workshop Computational Topology in Image Context, CTIC 2008. Signal, Image Communications, Université de Poitiers, pp. 39-49. Poitiers, France, June 2008.

Mabel Iglesias Ham, Adrian Ion, Walter Kropatsch: Documentation for the Graph Pyramid Drawing Application. PRIP-TR-117, TU Wien, 2008.

<ftp://ftp.prip.tuwien.ac.at/pub/publications/trs/tr117.pdf>

Mabel Iglesias, Adrian Ion, Walter Kropatsch, Edel B. García: “Delineating Homology Generators in Graph Pyramids”. In José R. Shulcloper and Walter G. Kropatsch, editors, Progress in Pattern Recognition, Image Analysis and Applications, Lecture Notes in Computer Science (LNCS 5197), pp. 576- 584, ISBN 978-3-540-85919-2, Proceedings, Springer, CIARP, Havana, Cuba, (2008).

Rocío González, Adrian Ion, Mabel Iglesias and Walter Kropatsch: Irregular Graph Pyramids and Representative Cocycles of Cohomology Generators. In Andrea Torsello, Francisco Escolano, and Mario Vento, editors, Proc. of the 7th IAPR-TC-15 International Workshop, GbRPR 2009, on Graph-Based Representations in Pattern Recognition, volume 5534 of Lecture Notes in Computer Science, LNCS, isbn 978-3-642-02123-7, pp 263-272, Springer-Verlag, Berlin, Heidelberg, Venice, Italy, 2009.

Mabel Iglesias Ham and Edel B. García: “Full-Body Human Action Recognition: State of the Art”. Technical Report. RT_021, ISSN 2072-6287, Blue Series, CENATAV 2009.

Mabel Iglesias, Walter Kropatsch, Rocío González and Adrian Ion: Object Classification by Topology of Convex Deficiencies. In 2nd Workshop on Computational Topology in Image

Context, pages 75–82, St. Kathrein/Offenegg, Austria, August 2009. PRIP, TU Wien. ISBN: 978-3-200-01582-1.

Mabel Iglesias, Edel García, Walter Kropatsch and Rocío González: Algorithm to Compute a Minimal Length Basis of Representative Cocycles of Cohomology Generators. In Rocío González Díaz and Pedro Real Jurado, editors, 3rd Workshop on Computational Topology in Image Context (CTIC), pages 121–128, Chipiona, Spain, November 2010. University of Seville, Spain. ISBN: 1885-4508, 2010. (IMAGEN-A .vol1 –no. 3, ISSN 1885-4508)

Rocio González-Díaz, Adrian Ion, Mabel Iglesias-Ham, and Walter G. Kropatsch. Invariant Representative Cocycles of Cohomology Generators using Irregular Graph Pyramids. Computer Vision and Image Understanding 115, pages 1011–1022, 2011.

Mabel Iglesias-Ham, Edel García-Reyes, Walter G. Kropatsch and Nicole Maria Artner: Convex Deficiencies for Human Action Recognition. Journal of Intelligent and Robotic Systems. DOI: 10.1007/s10846-011-9540-1, volume 64, numbers 3-4, pages 353-364, 2011.

Mabel Iglesias-Ham, Michael Kerber and Caroline Uhler: Sphere Packing with Limited Overlap. Canadian Conference on Computational Geometry (CCCG 2014). Available at <http://www.cccg.ca/proceedings/2014/papers/paper23.pdf>

RESEARCH PROJECTS

Cuba 2005-2007

Project of Fingerprint Identification System:

- ✓ Henry's Classification Tool.
- ✓ An implementation of a graph grammar inference algorithm to the fingerprints analysis as a licentiate diploma thesis, 2005.
- ✓ An algorithm implementation to measure fingerprint image quality published in LNCS 2005.
- ✓ A fingerprint matching algorithm based on the multiple common substructures matching between graphs representations (within the scope of a student's diploma thesis in 2006, improved version published in LNCS 2007).
- ✓ A fingerprint matching algorithm based on ridge matching (within the scope of a student's diploma thesis in 2007).
- ✓ An implementation of a computational tool to the evaluation of fingerprint matching algorithms.

Cuba 2005

Implementation of a chain grammar inference algorithm using a genetic strategy to classify DNA spots presented in UCIencia.

Cuba 2008-2009

Project of Palmprint Identification System:

- ✓ Database creation with a set of palmprint and latent images for evaluation of new matching algorithms.
- ✓ Palmprint Edition Tool.
- ✓ Latent Palmprint Edition Tool.

Cuba 2008-2011

Project of Human Action Recognition in Video Sequences

- ✓ State of the Art about Full-Body Human Action Recognition
- ✓ An algorithm to delineate irregular graph pyramids and homology generators in every level.
- ✓ An algorithm to compute representative cocycles of cohomology generators in irregular graph pyramids.
- ✓ An algorithm to compute a minimal basis of representative cocycles of cohomology generators.
- ✓ A Representation based on convex deficiencies for human action recognition.

Austria 2013 -

PhD Project Geometric Models for Chromosome Organization

- ✓ 3D model of the eukaryotic nucleus at chromatin domains level using convex optimization (Rotation Project).
- ✓ Optimal lattice packings with limited overlap in a parameterized family of lattices.
- ✓ Formulas for the computation of volume covered by at least k balls in 3D.

SKILLS

LANGUAGES:

Spanish (Native) + English

PROGRAMMING LANGUAGES:

Matlab, C#, C++, Java, Sql, Oracle...

Last update: Feb 2015