Leonardo Chang | CV

Research Professor @ Tecnologico de Monterrey, campus Santa Fe
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Personal Information

Full Name	*Leonardo Chang Fernández*
Date of Birth	*November 15th, 1984*
Gender	*Male*
Nacionality	*Cuban*
Languages	*Spanish (native), English (TOEFL 649 pts)*

Education

National Institute for Astrophysics, Optics and Electronic, INAOE **Puebla, Mexico**
Ph.D., Computer Science *2011–2015*
Advisors: Dr. L. Enrique Sucar, Dr. Miguel Arias, Dr. José Hernández
Thesis: *An object description and categorization method based on shape and appearance features.*

National Institute for Astrophysics, Optics and Electronic, INAOE **Puebla, Mexico**
M.Sc., Computer Science *2009–2010*
Advisors: Dr. L. Enrique Sucar, Dr. Miguel Arias, Dr. José Hernández
Thesis: *Hardware architecture for SIFT interest keypoints detection in images.*

CUJAE University **Havana, Cuba**
B. Tech, Informatics Engineering *2002–2007*
Graduated with Honors
Advisor: Eng. Heydi Méndez-Vázquez, CENATAV
Thesis: *Image capture and geometric normalization for automatic face recognition.*

Employment

Tecnologico de Monterrey (campus Santa Fe) **Mexico**
Research Professor *2018–Present*

Tecnologico de Monterrey (campus Estado de Mexico) **Mexico**
Postdoctoral Researcher *2017–2018*

Advanced Technologies Application Center, CENATAV **Havana, Cuba**

Head of the Face Recognition Group *2015–2017*

Associate Researcher *2016–2017*

Assistant Researcher *2012–2016*

Junior Researcher *2009–2012*

General Specialist in Informatics *2007–2009*

Research Interests

- Computer Vision
- Face Recognition
- Object Categorization
- Intelligent Video-Surveillance

Awards and Recognition

- **Distinguished Professor for Year 2020**, awarded for outstanding teaching and research results. By Tecnologico de Monterrey (QS-ranked 155 university in the World, QS top 1 private university in Mexico), Mexico, 2020.
- **National Award for Technological Innovation**, awarded to the "DATYS Face Recognition Platform". By the Ministry of Science, Technology and Environment (CITMA), Cuba, 2020.
- **Best Thesis Award in Technical Science of Year 2019**, obtained by my Ph.D. student Yoanna Martinez and co-supervised with Dr. Heydi Mendez. Cuban Academy of Science, Cuba, 2019.
- **Member of SNI (*Sistema Nacional de Investigadores*), Level C.** Period Jan/2019 – Dec/2021, CONACYT, México, 2018.
- **Young Researcher Mention Award in the Computer Science Category of Year 2015**, Ministry of Science, Technology and Environment. Cuba, May 2016.
- **Young Researcher of the Year Award 2015**. Interior Ministry. January 2016, Cuba.
- **Best Scientific and Technological Result of 2015**. "Object Description and Categorization Methods based on Shape and Appearance Features". Interior Ministry. January 2016, Cuba.
- **Software Quality Award**. "Multi-Biometric Platform for Criminal Investigation". INFORMATICA 2013 International Convention and Fair. Havana, Cuba. March 2013.
- **Best Scientific and Technological Result of 2011**. "Computational Tools for Automatic Face Recognition". Cuban Academy of Science. Havana, Cuba, March 2012.
- **Certificate of Honor**. For Excellence in academic results. Best graduates Generation 2007. Faculty of Informatics, CUJAE University. Havana, Cuba. 2007.

- **First Prize**. Software Engineering Competition. Faculty of Informatics, CUJAE University. Havana, Cuba. 2006.
- **National Mention Award**. "An educational software". Tenth National Exhibition "Forgers of the Future" of the Juvenile Technical Brigades (BTJ), Cuba. 2003.
- **Relevant Prize**. "An educational software". Provincial Exhibition of the Juvenile Technical Brigades (BTJ), Havana, Cuba. 2002.

Publications (indexed in Scopus/WoS)

1. Yoanna Martínez-Díaz, Miguel Nicolás-Díaz, Heydi Méndez-Vázquez, Luis S. Luevano, Leonardo Chang, Miguel Gonzalez-Mendoza, Luis Enrique Sucar . **Benchmarking lightweight face architectures on specific face recognition scenarios**. Artificial Intelligence Review (2021).[Paper]

2. Lázaro J González-Soler, Marta Gomez-Barrero, Jascha Kolberg, Leonardo Chang, Airel Pérez-Suárez, Christoph Busch. Fingerprint **Local Feature Encoding for Unknown Presentation Attack Detection: An Analysis of Different Local Feature Descriptors.** IET Biometrics, 2021. [Paper]

3. Hurst-Tarrab, N.; Chang, Leonardo; Gonzalez-Mendoza, M.; Hernandez-Gress, N. **Robust Parking Block Segmentation from a Surveillance Camera Perspective.** Appl. Sci. 2020, 10, 5364. [Paper] [GitHub]

4. Lázaro J González-Soler, Marta Gomez-Barrero, Leonardo Chang, Airel Pérez-Suárez, Christoph Busch. Fingerprint **Presentation Attack Detection Based on Local Features Encoding for Unknown Attacks.** IEEE Access, 2020. [Paper]

5. Leonardo Chang, A Pérez-Suárez, M González-Mendoza. **Effective and Generalizable Graph-Based Clustering for Faces in the Wild**. Computational Intelligence and Neuroscience, 2019. [Paper]

6. Yoanna Martínez-Díaz, Noslen Hernandez, Rolando J Biscay, Leonardo Chang, Heydi Méndez-Vázquez, Enrique Sucar. **On Fisher Vector Encoding of Binary Features for Video Face Recognition.** Journal of Visual Communication and Image Representation, 51, pp. 155-161, 2018. [Paper]

7. Lazaro J. Gonzalez Soler, Airel Perez-Suarez, and Leonardo Chang. **Static and incremental overlapping clustering algorithms for large collections processing in GPU**. Informatica 42 (2), 229-244. 2018. [Paper]

8. Leonardo Chang, Airel Pérez-Suárez, J. Hernández-Palancar, M. Arias-Estrada, L. Enrique Sucar. **Improving visual vocabularies: a more discriminative, representative and compact bag of visual words.** Informatica 41 (3). 2017. [Paper]

9. Leonardo Chang, José Hernández-Palancar, L. Enrique Sucar and Miguel Arias-Estrada, **FPGA-based detection of SIFT interest keypoints.** Machine vision and applications, 24(2), 371-392. 2013. [Paper]

10. Leonardo Chang, Miriam M. Duarte, L. E. Sucar, and Eduardo F. Morales. **A Bayesian approach for object classification based on clusters of SIFT local features**. Expert Systems with Applications, 39(2), 1679-1686. 2012. [Paper]

11. Martínez-Díaz, Yoanna; Mendez-Vazquez, Heydi; Luevano, Luis S.; Chang, Leonardo; Gonzalez-Mendoza, Miguel. Lightweight Low-Resolution Face Recognition for Surveillance Applications. International Conference on Pattern Recognition ICPR 2020.

12. Byrd, E., González-Mendoza, M. and Chang, L., 2020, October. **Exploitation of Deaths Registry in Mexico to Estimate the Total Deaths by Influenza Virus: A Preparation to Estimate the Advancement of COVID-19.** In Mexican International Conference on Artificial Intelligence (pp. 459-469). Springer, Cham. [Paper]

13. Yoanna Martindez-Diaz, Luis S Luevano, Heydi Mendez-Vazquez, Miguel Nicolas-Diaz, Leonardo Chang‘, Miguel Gonzalez-Mendoza. **ShuffleFaceNet: A Lightweight Face Architecture for Efficient and Highly-Accurate Face Recognition.** Proceedings of the IEEE International Conference on Computer Vision (ICCV), 2019. [Paper]

14. Fernando Camarena, Leonardo Chang, Miguel Gonzalez-Mendoza. **Improving the Dense Trajectories Approach Towards Efficient Recognition of Simple Human Activities.** 7th IEEE International Workshop on Biometrics and Forensics (IWBF), 2019. [Paper]

15. Lazaro Janier Gonzalez-Soler, Marta Gomez- Barrero, Leonardo Chang, Airel Perez-Suarez, Christoph Busch. **On the Impact of Different Fabrication Materials on Fingerprint Presentation Attack Detection.** The International Conference on Biometrics (ICB 2019). [Paper]

16. Yoanna Martínez-Díaz, Leonardo Chang, Heydi Méndez-Vázquez, L. Enrique Sucar, Leyanis López-Avila, Massimo Tistarelli. **Toward More Realistic Face Recognition Evaluation Protocols for the YouTube Faces Database.** The IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Workshops, 2018, pp. 413-421. [Paper]

17. González-Soler L.J., Leonardo Chang, Hernández-Palancar J., Pérez-Suárez A., Gomez-Barrero M. (2018) **Fingerprint Presentation Attack Detection Method Based on a Bag-of-Words Approach.** In: Mendoza M., Velastín S. (eds) Progress in Pattern Recognition, Image Analysis, Computer Vision, and Applications. CIARP 2017. Lecture Notes in Computer Science, vol 10657. Springer, Cham. [Paper]

18. Méndez N., Bouza L.A., Leonardo Chang, Méndez-Vázquez H. (2018) **Efficient and Effective Face Frontalization for Face Recognition in the Wild.** In: Mendoza M., Velastín S. (eds) Progress in Pattern Recognition, Image Analysis, Computer Vision, and Applications. CIARP 2017. Lecture Notes in Computer Science, vol 10657. Springer, Cham. [Paper]

19. Yoanna Martínez-Díaz, Leonardo Chang, Noslen Hernández, Heydi Mendez-Vazquez, L. Enrique Sucar. **Efficient Video Face Recognition by Using Fisher Vector Encoding of Binary Features.** In International Conference on Pattern Recognition, ICPR 2016. [Paper]

20. Leonardo Chang, Airel Pérez Suárez, Máximo Rodríguez-Collada, José Hernández Palancar, Miguel O. Arias-Estrada, and Luis Enrique Sucar. **Assessing the Distinctiveness and Representativeness**

of Visual Vocabularies. In CIARP 2015, volume 9423 of Lecture Notes in Computer Science, page 331-338. [Paper]

21. Leonardo Chang, Miguel Arias-Estrada, José Hernández Palancar, L. Enrique Sucar and Liliana Barbosa-Santillán. **Visual Semantics from an Accelerated Model Extraction and Construction.** Poster Session of GTC 2015: GPU Technology Conference 2015, San José California, USA, 2015. [Poster]

22. Leonardo Chang, M. Arias-Estrada, Hernández-Palancar J. and Sucar L. E. (2014). **An Efficient Shape Feature Extraction, Description and Matching Method using GPU.** In International Conference on Pattern Recognition Applications and Methods - Best Papers Special Issue (pp. 206-221). Springer International Publishing. [Paper]

23. Leonardo Chang, Miguel Arias-Estrada, José Hernández-Palancar, and L. Enrique Sucar. **Partial shape matching and retrieval under occlusion and noise.** In Iberoamerican Congress on Pattern Recognition CIARP 2014 (pp. 151-158). Springer International Publishing. [Paper]

24. Lazaro J. Gonzalez Soler, Airel Perez-Suarez, and Leonardo Chang. **Efficient Overlapping Document Clustering Using GPUs and Multi-core Systems.** In Iberoamerican Congress on Pattern Recognition CIARP 2014 (pp. 151-158). Springer International Publishing. [Paper]

25. Leonardo Chang, Miguel Arias-Estrada, L. Enrique Sucar, and José Hernández Palancar. **Efficient Extraction and Matching of LISF Features in GPU.** Poster Session of GTC 2014: GPU Technology Conference 2014, San José California, USA, 2014. [Poster]

26. Leonardo Chang, Miguel Arias-Estrada, L. Enrique Sucar, and José Hernández Palancar. **LISF: An invariant local shape features descriptor robust to occlusion.** In ICPRAM 2014 - Proceedings of the 3rd International Conference on Pattern Recognition Applications and Methods, ESEO, Angers, Loire Valley, France, 6-8 March, 2014, pages 429–437, 2014. [Paper]

27. Leonardo Chang, Miguel Arias-Estrada, L. Enrique Sucar, and José Hernández Palancar. **Efficient Local Shape Features Matching using CUDA**. Poster Session of GTC 2013: GPU Technology Conference 2013, San José California, USA, 2013. [Poster]

28. Nelson Méndez, Leonardo Chang, Yenisel Plasencia-Calaña, Heydi Méndez-Vázquez. **Facial Landmarks Detection Using Extended Profile LBP-Based Active Shape Models**. In Iberoamerican Congress on Pattern Recognition CIARP 2013 (pp. 407-414). Springer Berlin Heidelberg. [Paper]

29. Heydi Méndez Vázquez, Leonardo Chang, Dayron Rizo Rodríguez, Annette Morales-González. **Face Image Quality Evaluation for Person Identification**. Computación y Sistemas. Vol. 16, No. 2 (2012). [in Spanish]. [Paper]

30. Leonardo Chang, Miriam Monica Duarte, Luis Enrique Sucar, and Eduardo F. Morales. **Object Class Recognition using SIFT and Bayesian Networks.** In Grigori Sidorov, Arturo Hernández Aguirre, and Carlos A. Reyes García, editors, MICAI (2), volume 6438 of Lecture Notes in Computer Science, pages 56–66. Springer, 2010. [Paper]

31. Leonardo Chang and José Hernández-Palancar. A **Hardware Architecture for SIFT Candidate Keypoints Detection.** In E. Bayro-Corrochano and J.-O. Eklundh editors, CIARP, volume 5856 of Lecture Notes in Computer Science, pages 95–102. Springer, 2009. [Paper]

32. Leonardo Chang, Ivis Rodés, Heydi Mendez Vázquez, and Ernesto del Toro. **Best-shot selection for video face recognition using FPGA.** In José Ruiz-Shulcloper and Walter G. Kropatsch, editors, CIARP, volume 5197 of Lecture Notes in Computer Science, pages 543–550. Springer, 2008. [Paper]

Other Publications in Spanish

33. Máximo Rodríguez-Collada, Airel Pérez-Suárez, Leonardo Chang. Propuestas para el mejoramiento del enfoque BoW en la clasificación de objetos. En: XIII Congreso Nacional de Reconocimiento de Patrones, RECPAT 2015, Santiago de Cuba, Cuba, 27-29 de octubre de 2015. 10 p ISBN 978-959-207-540-5.

34. Lázaro Janier González Soler, Airel Pérez Suárez, Leonardo Chang. Algoritmo incremental de agrupamiento con traslape basado en GPU para el procesamiento de grandes colecciones de datos. En memorias del evento internacional COMPUMAT 2015. ISBN: 978-959-286-036-0.

35. Nelson Méndez Llanes, Leonardo Chang, Heydi Méndez-Vázquez. Resumen de Enfoques de Reconocimiento de Rostros invariantes a pose. En: XIII Congreso Nacional de Reconocimiento de Patrones, RECPAT 2015, Santiago de Cuba, Cuba, 27-29 de octubre de 2015. 10 p ISBN 978-959-207-540-5.

36. Nelson Méndez Llanes, Leonardo Chang. Extensión del modelo de la forma en el EP-LBP. En: XIII Congreso Nacional de Reconocimiento de Patrones, RECPAT 2015, Santiago de Cuba, Cuba, 27-29 de octubre de 2015. 10 p ISBN 978-959-207-540-5.

37. Nelson Méndez Llanes, Leonardo Chang, Yenisel Plasencia-Calaña, Heydi Méndez-Vázquez. Detección de Puntos Característicos del Rostro usando una Descripción Local Mejorada del ASM. En: XII Congreso Nacional de Reconocimiento de Patrones, RECPAT 2014, Universidad de Las Tunas, Cuba, 7-9 de octubre de 2014. 10 p. ISBN: 978-959-16-2284-6

38. Lazaro J. Gonzalez Soler, Airel Perez-Suarez, and Leonardo Chang. "Algoritmos eficientes para el agrupamiento con traslape, utilizando GPU y sistemas multi-núcleo." En RECPAT 2014.

39. Heydi Méndez Vázquez, Leonardo Chang Fernández, Annette Morales González- Quevedo, Yenisel Plasencia Calaña. Herramientas computacionales para el Reconocimiento de Rostros. Revista RECIDT ISSN 1684-6826. 2012.

40. Leonardo Chang, José Hernandez-Palancar. Reconocimiento de rostros usando FPGAs. Revista RECIDT ISSN 1684-6826. 2012.

41. Leonardo Chang, José Hernandez-Palancar. Características locales de forma para la clasificación de objetos. Memorias del Evento RECPAT 2012. ISBN: 978-959-16-2065-1.

42. Leonardo Chang, José Hernández-Palancar. "Detección de puntos de interés del SIFT usando hardware reconfigurable". Proceedings of the National Congress on Pattern Recognition (RecPat'2010), ISBN: 978-959-16-1287-8, 2010.

43. Heydi Méndez-Vazquez, Leonardo Chang, Dayron Rizo, Annette Morales: "Evaluación de la Calidad de Imágenes de Rostros", Proceedings of Informática 2011. ISBN 978-959-7213-01-7, Febrero 2011.

44. Jasan Alvarez y Leonardo Chang. "Análisis de la simetría facial como medida de estimación de la pose del rostro". Memorias del evento COMPUMAT 2009, ISSN 1728-6042, Noviembre 2009.

45. Jasan Alvarez, Leonardo Chang y Francisco Silva. "Método de estimación de la dirección de la vista basado en rasgos oculares". Memorias del evento COMPUMAT 2009, ISSN 1728-6042. Noviembre 2009.

46. Leonardo Chang y José Hernández Palancar. "Reporte Técnico: Reconocimiento automático de rostros usando FPGAs". RT_013. Serie Azul. CENATAV, RNPS No. 2142, ISSN: 2072-6287, 2009.

47. Ernesto del Toro Hernández, Leonardo Chang, and Alejandro Cabrera Sarmiento. "Implementación de una arquitectura tunelizada para el cálculo de nitidez en imágenes sobre un FPGA". In 2nd Internacional Symposium on Computing and Electronics. Informática 2009, ISBN: 978-959-286-010-0. 2009.

48. Leonardo Chang, Ivis Rodés y Heydi Mendez Vázquez. "Obtención de la mejor imagen para el Reconocimiento de Rostros". Memorias del evento RECPAT 2007, ISBN 978-959-286-006-3. Diciembre 2007.

49. Leonardo Chang, Ivis Rodés y Heydi Mendez Vázquez. "Obtención de la mejor imagen para el Reconocimiento de Rostros". Memorias del evento COMPUMAT 2007, ISSN 1728-6042. Noviembre 2007.

Research Projects

- *Video-surveillance for SmartSDK.* Tecnologico de Monterrey and European Union. (2017–2018). **Researcher.**
- *Pose-robust face recognition for unconstrained applications.* Advanced Technologies Application Center, CENATAV. (2015–2017). **Project Director.**
- *Face recognition applications to video and other non-controlled scenarios.* Advanced Technologies Application Center, CENATAV. (2013–2017). **Project Technical Leader.**
- *Face recognition in non-controlled scenarios.* Advanced Technologies Application Center, CENATAV. (2011–2013). **Researcher.**
- *Algorithms parallelization using reconfigurable hardware* at Advanced Technologies Application Center, CENATAV. (2009–2015). **Researcher.**

- *Computational tools for automatic face recognition.* Advanced Technologies Application Center, CENATAV. (2007–2011). **Research engineer.**

Thesis Supervision

Graduated Ph.D. Students

1. Yoanna Martínez Díaz, **"Efficient Video Face Recognition for Realtime Applications"**, CENATAV, co-supervised with Dr. Enrique Sucar (INAOE, Mexico) and Dr. Heydi Mendez (CENATAV, Cuba), 2015–2018. **Best Thesis Award of Year 2019, Cuban Academy of Science.**

Current Ph.D. Students

1. Luis Fernando Camarena, **"Unsupervised and semi-supervised learning for computer vision task"**, Tecnológico de Monterrey, campus Estado de México, co-supervised with Dr. Miguel González, 2020–Present.

2. Luis Santiago Luevano, **"Low-resolution face recognition in videos"**, Tecnológico de Monterrey, campus Estado de México, co-supervised with Dr. Miguel González, 2019–Present.

3. Ricardo Cuevas, **"Realtime Fisher Vector Encoding for Video Surveillance"**, Tecnológico de Monterrey, campus Estado de México, co-supervised with Dr. Miguel González, 2017–Present.

4. Nelson Méndez Llanes, **"Pose-robust Face Recognition using Deep Neural Networks"**. CENATAV, co-supervised with Dr. Heydi Mendez (CENATAV, Cuba), 2014–Present.

Graduated M.Sc. Students

1. Mario Durán Vega. **"Video Detection of Armed People using OpenPose, YOLOv3 and ConvLSTMs"**, Tecnológico de Monterrey, campus Monterrey, co-supervised with Dr. Miguel González, 2018–2020.

2. Cuauhtemoc Daniel Suárez Ramírez. **"A Mathematical Approach to Optimization of Deep Learning CNNs Architectures During the Learning Phase"**, Tecnológico de Monterrey, campus Monterrey, co-supervised with Dr. Miguel González, 2018–2020.

3. Fernando Camarena, **"Action recognition by key trajectories"**, Tecnológico de Monterrey, campus Estado de México, co-supervised with Dr. Miguel González, 2017–2018.

4. Nisim Hurst, **"Parking lot mapping from aerial parking lot images"**, Tecnológico de Monterrey, campus Estado de México, co-supervised with Dr. Miguel González, 2017–2019.

Current M.Sc. Students

1. Luis Alberto Garnica Lopez. "Contextual Information for Person Re-Identification on Outdoors Environments", Tecnológico de Monterrey, campus Monterrey, co-supervised with Dr. Miguel González, 2019–present.

2. Juan Carlos Ángeles, Tecnológico de Monterrey, campus Monterrey, co-supervised with Dr. Miguel González, 2019–present.

3. Enmanuel Byrd, Tecnológico de Monterrey, campus Estado de México, co-supervised with Dr. Miguel González, 2019–present.

Graduated Bachelor Students

1. Leyanis López, "Face Recognition using Convolutional Networks". Havana University, Cuba, 2016.
2. Máximo Rodríguez Collada, "Improving the Bag of Words Approach for Object Class Recognition". Havana University, Cuba, 2015.
3. Lázaro Janier González Soler, "Efficient Overlapping Document Clustering Using GPUs and Multi-core Systems". Havana University, Cuba, 2014.
4. Nelson Méndez Llanes, "Face Landmark Detection". Havana University, Cuba, 2013.
5. Mayrelis Hernández Durán, "Face Recognition with Low Resolution Images". Instituto Superior Politécnico José Antonio Echeverría, CUJAE, La Habana, Cuba, 2013.
6. Jasan Álvarez Méndez, "Face Image Quality Assessment: Pose and Gaze". Havana University, Cuba, 2009.
7. Mireilis Olema Casuso Barrios, "Face Image Quality Assessment: System Architecture". Instituto Superior Politécnico José Antonio Echeverría, CUJAE, La Habana, Cuba, 2008.

Technical Skills

Languages: C/C++, Python C#, Matlab, CUDA, Assembly, VHDL, Objective-C, Java.

Development Tools: Tensor Flow, Keras, Pytorch, Microsoft Visual Studio, XCode, Eclipse, OpenMP, OpenCV, VLFeat, Dlib, Microsoft TFS, Github.

Databases: MongoDB, SQL, MySQL, Oracle.

Strengths: Object-oriented Programming, Data Structures, Computer Vision, Image Processing, Machine Learning, RUP-based Software Engineering, Computer Graphics, iOS App Development, Parallel Programming on multi-core architectures, FPGAs and GPUs.

Other: Strong leadership, communication, and collaboration skills. Skilled in critical thinking, logic, and high math.

Teaching Experience

Visual Object Recognition in Images and Videos **Cuba**
Advanced Technologies Application Center (CENATAV) *2016*
As part of the Pattern Recognition and Data Mining Postgraduate Course. General concepts of visual object recognition. Different tasks of visual object recognition: specific object recognition and object categorization. State-of-the-art methods for both tasks. Definition and concepts of local invariant features and bag-of-words approaches. Shape-based object categorization and detection. OpenCV/C++ example code.

Introduction to Hardware-based Algorithm Speedup using FPGAs and GPUs **Cuba**
Advanced Technologies Application Center (CENATAV) *2016*
As part of the Pattern Recognition and Data Mining Postgraduate Course. General concepts of hardware acceleration and parallel processing. Amdahl's Law. Introduction to FPGAs and GPUs computing. Hardware design, advantages, comparison to CPUs, development tools. Application examples and results.

C/C++ Programming I **Cuba**
Informatics Engineering Program, CUJAE University *2006–2007*
Course goals: Understand and use the basic programming constructs of C/C++. Manipulate various C/C++ datatypes, such as arrays, strings, and pointers. Isolate and fix common errors in C++ programs. Use memory appropriately, including proper allocation/deallocation procedures. Defining a class in C++. Inheritance. Implementing polymorphic methods in programs. Apply object-oriented approaches to software problems in C++.

SQL Database Design **Cuba**
Informatics Engineering Program, CUJAE University *2006*
Describe key database concepts in the context of SQL Server. Describe data modelling techniques. Normalization and denormalization techniques. Relationship types and effects in database design. The effects of database design on performance.

C/C++ Programming I, Student Assistant **Cuba**
Informatics Engineering Program, CUJAE University *2005*
Responsible of practical classes, laboratories, projects and exams evaluations.

C/C++ Programming I, as Student Assistant **Cuba**
Informatics Engineering Program, CUJAE University *2004*
Responsible of practical classes, laboratories, projects and exams evaluations.

Invited Speaker

- *Hands-on Face recognition with Deep Learning*. **Tutorial in COMIA 2018** (Congreso Mexicano de Inteligencia Artificial). (June 2018, Mérida, México).

Member of Review Committees

- Member of the Scientific Board of DATYS, Cuba (2015 – 2017).
- Member of the Scientific Committee of CENATAV, Cuba (2015 – 2017).
- Reviewer for top journals: Pattern Recognition, Neurocomputing, Machine Vision and Applications, Informatica, IEEE Sensors, IEEE Access, Transactions on Software Engineering.
- Reviewer for top conferences: CVPR, ECCV, CAIP, CIARP, MCPR, RECPAT, COMIA, IEEE Access.

Academic Visits

- Postdoctoral Academic Visit, National Institute for Astrophysics, Optics and Electronics (INAOE), with Dr. L. Enrique Sucar, Puebla, Mexico, May 2016. Research in Efficient Video Face Recognition

using Fisher Vector Encoding of Binary Features.