Luz Abril Torres-Méndez

Personal Information	Date of birth:	November 6, 1972
	Citizenship:	Mexican
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Current position

Full-time researcher
Robotics and Advanced Manufacturing Group
Centro de Investigación y de Estudios Avanzados (CINVESTAV)
Campus Saltillo.
2006- present

Research Interests

My primary research interests are on computer vision and mobile robotics. In particular, in the 3D environment modeling, active perception, human-robot interaction, transferring cognitive skills to robots, underwater image enhancement; super-resolution and color synthesis on faces.

Education

- Ph.D. Computer Science, McGill University, Montreal, QC, Canadá, Dec. 2005.
- Master of Science, Computer Science, Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM) Campus Morelos, Temixco, Morelos, México, 1995.
- Bachelor in Engineering, Computer Engineering, Instituto Tecnológico de Veracruz, Veracruz, Veracruz, México, 1992.

Teaching

At the Robotics and Advanced Manufacturing program:

- Introduction to Visual Servo Control.
- Mutli-sensorial Data Fusion.
- Computer Vision I
- 3D Computer Vision
- Structured Programming

Honors and Distintions

- Member of the National System of Researchers (SNI) Level I (2010-2013).
- Member of the National System of Researchers (SNI) Candidate Level (2007-2009).
- First place of Best Paper Award of the *Fifth Mexican International Conf. on Artificial Intelligence*, with the paper:

  L.A. Torres-Méndez and G. Dudek."Statistics of Visual and Partial Depth Data for Mobile Robot Environment Modeling" in *Advances in Artificial Intelligence - MICAI*, A. Gelbukh, and C.A. Reyes-García (Eds.), LCNS 4293, pp. 715-725, 2006. ISSN: 0302-9743, ISBN: 978-3-540-49026-5.
- Finalist of the "Mexican Women Inventors Innovators Prize: Julieta Fierro Edition" with the project: "Color Recovery and Enhancement of Underwater Images", Mexico, D.F., Junio 2007.
- Third place of Best Poster Award. *III Encounter for Women in Science.* L. A. Torres-Méndez and G. Dudek, "Fusión de Datos Sensoriales Incompletos para el Modelado de Ambientes en 3D utilizando Robots Móviles", León, Guanajuato, México. (2006).
- Canadian IRIS-PRECARN Student-Scholar [2002-2004]
- Scholarship for pursuing my PhD studies from the Consejo Nacional de Ciencia y Tecnología (CONACyT). [1999-2001].
- Scholarship for pursuing my masters studies from the Consejo Nacional de Ciencia y Tecnología (CONACyT). [1993-1995].

Publications

Edited Books

1. L. A. Torres-Méndez. *Inter-Image Statistics for Mobile Robot Environment Modeling*, Verlag Dr. Muller, Germany, (McGill University dissertation), **2008**.
2. Edgar Alonso Martínez and Luz Abril Torres-Méndez. *Autonomous Robots: Control, Sensing and Perception*, Publisher: Cuvillier Verlag. Septiembre, **2011**. ISBN-13: 978-3-86955-866-0.

International Journals

1. J. Miranda-Hernández, M. Castelán and L. A. Torres-Méndez. "Face Color Synthesis Using Partial Least Squares and the $L\alpha\beta$ Color Transform, IET Computer Vision, **2012** (accepted).
2. G.Y. Chen, G. Dudek and L.A. Torres-Méndez, "Scene reconstruction with sparse range information." *Optical Engineering* Vol. 50(9), pp. 1-7. ISSN: 0091-3286, September, **2011**.
3. Ricardo Pérez and Luz Abril Torres-Méndez, "Relative Depth Estimation of Objects in Underwater Scenes", *Special Issue: Advances in Pattern Recognition, Research in Computer Science* 44, pp. 29-36. J. A. Carrasco Ochoa, J. F. Martínez Trinidad, J. H. Sossa Azuela (Eds.). ISSN: 1870-4069, **2009**.

4. L. A. Torres-Méndez and G. Dudek, 'Inter-Image Statistics for 3D Environment Modeling", *International Journal of Computer Vision (IJCV)*. Springer Netherlands, pp. 137-158. ISSN: 0920-5691, August **2008**.
5. G. Dudek, P. Giguere, C. Prahacs, S. Saunderson, J. Saltar, L.A. Torres-Méndez, M. Jenkin, A. German, A. Hogue, A. Ripsman, J. Zacher, E. Milios, H. Liu, P. Zhang, M. Buehler, C. Georgiades, "AQUA: An Amphibious Autonomous Robot", *IEEE Computer Magazine*, Vol. 40, No. 1, pp. 46-53. SSN: 0018-9162, Enero **2007**.
6. L. A. Torres-Méndez and G. Dudek, "Color Correction of Underwater Images for Aquatic Robot Inspection", *Lecture Notes in Computer Science 3757*, Springer A. Rangarajan, B.C. Vemuri, A.L. Yuille (Eds.), pp. 60-73, ISBN:3-540-30287-5, **2005**.
7. L. A. Torres-Méndez and G. Dudek, "A Statistical Learning-Based Method for Color Correction of Underwater Images", *Research on Computer Science Vol. 17, Advances in Artificial Intelligence Theory*, A. Gelbukh, R. Monroy (Eds.), pp. 151-160, ISSN: 1665-9899, **2005**.
8. L. A. Torres-Méndez, J. C. Ruiz-Suarez, L. E. Sucar and G. Gomez. "Translation, Rotation, and Scale-Invariant Object Recognition", *IEEE Transactions on Systems, Man and Cybernetics. Part C: Applications and Reviews*, 30(1):125-130, **2000**.
9. L. A. Torres, F. J. Rodríguez and J. Sebastian. "Simulation of a solar-hydrogen-fuel cell system: results for different locations in Mexico", *International Journal of Hydrogen Energy*, 23(11):1005-1009, **1998**.

Book Chapters

1. Emerson J. Olaya-Benítez and L. Abril Torres-Méndez, "A Biologically-inspired Robotic Vision System for Tracking Fast Moving Objects. *Autonomous Robots: Control, Sensing and Perception.* Book edited by E. A. Martínez and L. A. Torres-Méndez, Cuvillier-Verlag, pp. 236-261. ISBN: 978-3-86955-866-0. September **2011**.
2. L. A. Torres-Méndez. "Multisensorial Active Perception for Indoor Environment Modeling". *Sensor Fusion and its Applications*, Book edited by Ciza Thomas, ISBN: 978-953-307-101-5, Publisher: SCIYO, pp. 207-223, Agosto **2011**.
3. L.A. Torres-Méndez, M.I. Ramírez-Sosa and M. Castelán, "A Single Frame Super-Resolution Innovative Approach", *Lecture Notes in Artificial Intelligence 4827, MICAI*, Springer, A. Gelbukh and A.F. Kuri Morales (Eds.), pp. 640-649. ISSN: 0302-9743 (Print) 1611-3349 (Online). ISBN: 978-3-540-76630-8, **2007**.
4. M. Castelán, A.J. Almazán-Delfín, M.I. Ramírez-Sosa and L.A. Torres-Méndez, "Example-Based Face Shape Recovery Using the Zenith Angle of the Surface Normal", *Lecture Notes in Artificial Intelligence 4827, MICAI*, Springer, A. Gelbukh and A.F. Kuri Morales (Eds.), pp. 758-768. ISSN: 0302-9743 (Print) 1611-3349 (Online). ISBN: 978-3-540-76630-8, **2007**.
5. L. A. Torres-Méndez and G. Dudek, "Statistics of Visual and Partial Depth Data for Mobile Robot Environment Modeling", *Lecture Notes in Artificial Intelligence 4293: MICAI*, Springer. A. Gelbukh and C.A. Reyes-Garca (Eds.), pp. 715-725. ISSN: 0302-9743, ISBN: 978-3-540-49026-5, **2006**.

International Conference Proceedings

1. Griselda Ortiz-Alvarado and L. Abril Torres-Méndez."Multi-sensorial Active Perception for 3D Environment Modelling using Non-Parametric Belief Propagation. In the *International Congress on Instrumentation and Applied Sciences.* Puebla, Pue., Octubre 5-8, **2011**.
2. Martha Lorena Quiones Muoz and L. Abril Torres-Méndez. "A User-friendly Graphical Simulation Tool for Evaluating the Distribution of Cameras in Surveillance and Robotics Applications. In the *International Congress on Instrumentation and Applied Sciences.* Puebla, Pue., Octubre 5-8, **2011**.
3. Luz A. Torres-Méndez and Emerson J. Olaya. "A Novel Illumination-invariant Colour Constancy Algorithm". In the *22nd General Congress of the International Commission for Optics* (ICO-22). Puebla, Pue., México, Agosto 15-19, **2011**.
4. Luz A. Torres-Méndez and Emerson J. Olaya. "A Biologically-inspired Robotic Vision System for Tracking Fast Moving Objects". In the *3rd Annual IEEE International Conference on Technologies for Practical Robot Applications.* Greater Boston Area, Massachusetts, USA, Abril 11-12, **2011**.
5. E. J. Olaya and L. A. Torres-Méndez. "Moving Object Segmentation using Visual Attention". In the *Automatic Image Annotation and Retrieval Workshop.* Puebla, México, Octubre 6-8, **2010**.
6. Emerson Jassan Olaya and Luz Abril Torres-Mndez, "A Foveated Stereo Vision System for Active Depth Perception", in the *IEEE International Workshop on Robotic and Sensors Environments (ROSE)*, pp. 110-115. Lecco, Italy, November 6-7, **2009**.
7. Luz Abril Torres-Mndez, Christian A. Ramrez-Bejarano, Griselda Ortz-Alvarado, Carlos A. de Alba-Padilla, "A Fast Color Synthesis Algorithm using the l-alpha-beta Color Space and a Non-parametric MRF Model", in the *8th Mexican International Conference on Artificial Intelligence (MICAI)*, pp. 53-58. Guanajuato, Gto., Mexico, November 9-13, **2009**.
8. S. A. Rosales-Morales, L. A. Torres-Méndez, "A Statistical Analysis of Visual Cues for Estimating Dense Range Maps", in the *Proceedings of the 7th Mexican International Conference on Artificial Intelligence (MICAI)*, Mexico City, October 27-31, **2008**.
9. G. Dudek, M. Jenkin, C. Prahacs, A. Hogue, J. Sattar, P. Giguerre, A. German, H. Liu, S. Saunderson, A. Ripsman, S. Simhon, L.A. Torres, E. Milios, P. Zhang and I. Rekletis, "A Visually Guided Swimming Robot, in *Proceedings of the IEEESJ International Conference on Intelligent Robots and Systems* (IROS), Edmonton, Alberta, Canada, August **2005**.
10. G. Chen, G. Dudek and L. A. Torres-Méndez, "Scene Reconstruction with Sparse Range Information", in *Proceedings of the 2nd Canadian Conference on Computer and Robot Vision (CRV)*, pp. 444-451, Vancouver, B.C., Canada, May **2005**.
11. L. A. Torres-Méndez and G. Dudek, "Statistics in the Image Domain for Mobile Robot Environment Modeling", in *Proceedings of the International Symposium on Robotics and Automation* (ISRA), Querétaro, Mexico, 8 pages, August 25-27, **2004**.
12. L. A. Torres-Méndez and G. Dudek, "Statistical Inference and Synthesis in the Image Domain for Mobile Robot Environment Modeling", in *Proceedings of the IEEE/RSJ*

Conference on Intelligent Robots and Systems (IROS), Sendai, Japan. 8 pages. September **2004**.

13. C. Georgidas, A. German, A. Hogue, H. Liu, C. Prahacs, A. Ripsman, R. Sim, L.A. Torres, P. Zhang, M. Buehler, G. Dudek, M. Jenkin and E. Milios, "AQUA: An aquatic walking robot", in *Proceedings of the IEEEE/RSJ/GI International Conference on Intelligent Robots and Systems*, (IROS), Sendai, Japón, pp. 3525–3531, September **2004**.
14. C. Georgidas, A. German, A. Hogue, H. Liu, C. Prahacs, A. Ripsman, R. Sim, L.A. Torres, P. Zhang, M. Buehler, G. Dudek, M. Jenkin and E. Milios, "AQUA: an aquatic walking robot", in *Proceedings of the* 6^{th} *Unmanned Underwater Vehicle Showcase (UUVS)*, Southampton, UK, September 22-23, **2004**.
15. L. A. Torres-Méndez and G. Dudek, "Reconstruction of 3D models from intensity images and partial depth", in the *Nineteenth National Conference on Artificial Intelligence (AAAI)*, San Jose, California, USA, July 25-29, **2004**.
16. L. A. Torres-Méndez, G. Dudek and P. Di Marco, "Inter-Image Statistics for Scene Reconstruction", in the *Canadian Conference on Computer and Robot Vision (CRV)*, London, Ontario, Canada, May 17-19, **2004**.
17. L. A. Torres-Méndez and G. Dudek, "Underwater Image Deblurring by Exemplar-Based Synthesis", *1st International Workshop on Computational Robotics for Unstructured Environments: Underwater Environments*, St. James, Barbados, January 9-18, **2004**.
18. L. A. Torres-Méndez and G. Dudek, "Range Synthesis for 3D Environment Modeling", *Proceedings of the IEEE/RSJ Conference on Intelligent Robots and Systems (IROS)*, Las Vegas, NV. 8 pages. **2003**.
19. L. A. Torres-Méndez and G. Dudek, "A Statistical Learning Method for Mobile Robot Environment Modeling", in *Proceedings of the IEEE International Workshop on Reasoning with Uncertainty in Robotics (RUR-IJCAI)*, 8 pages, Acapulco, Mexico, August **2003**.
20. L. A. Torres-Méndez and G. Dudek. "Range Synthesis for 3D Environment Modeling", in *IEEE Workshop on Applications of Computer Vision*, Orlando, FL, USA, **2002**.
21. L. A. Torres-Méndez and G. Dudek, "Automated Enhancement of 3D Models", in *Short Presentations of Eurographics*, Saarbrucken, Germany, **2002**.
22. R. V. Mayorga and L. A. Torres, "Upper bound conditioning as a performance index for manipulator motion planning", in *Proceedings of the IEEE/RSJ Conference on Intelligent Robots and Systems (IROS)*, pages 1913-1918, IEEE Press. Victoria, Canada, October **1998**.
23. L. A. Torres, J. Rodríguez and P. J. Sebastian, "Simulation of a PV-hydrogen-fuel cell system: results for different cities of Mexico", *International Symposium on New Materials for Hydrogen-Fuel Cell-Photovoltaic Systems I*, Cancun, Mexico, September **1997**.

Local Conference Proceedings

1. Martha L. Quiñones Muñoz, L. A. Torres Méndez. "Herramienta de Simulación para Visualizar y Evaluar la Distribución de una Red de Cámaras para Aplicaciones en Robótica y Vigilancia". En el *VIII Encuentro Participación de la Mujer en la Ciencia*, , León, México, Mayo 18-20, **2011**.
2. Miranda Hernández, J., Castelán M., Torres Méndez, L. A. "Síntesis de Color en Imágenes de Rostros Humanos Usando Mínimos Cuadrados Parciales y la Transformación de Color l-alpha-beta", *Congreso Mexicano de Inteligencia Artificial*, Tlaxcala, Tlax., **2010**.
3. S. A. Rosales-Morales, L. A. Torres-Méndez, "Recuperacin de la Profundidad basada en el Anlisis Estadstico de Pistas Visuales", in the *V Encuentro Participacin de la Mujer en la Ciencia*, Len, Mxico, May 21-23, **2008**.
4. S. A. Rosales-Morales, L.A. Torres-Méndez, "Síntesis de Rango basado en Características Visuales Estadísticas para la Reconstrucción de Escenas 3D", in the *XXIII Congreso de Instrumentaci'on*, Xalapa, Veracruz, Mexico, October 1-3, **2008**.
5. L. A. Torres-Méndez, "Super-Resolución de Imágenes basada en Aprendizaje Estadístico a Múltiples Escalas", in *IV Encuentro Participación de la Mujer en la Ciencia*, León, Guanajuato, Mexico. **2007**.
6. L. A. Torres-Méndez and G. Dudek, "Fusión de Datos Sensoriales Incompletos para el Modelado de Ambientes en 3D utilizando Robots M'oviles", in "*III Encuentro Participacin de la Mujer en la Ciencia*, León, Guanajuato, Mexico. **2006**.
7. L. A. Torres-Méndez, J. C. Ruiz-Suárez and L. E. Sucar-Succar, "Translation, Rotation and Scale Invariant Object Recognition", in *Proceedings of the National Reunion of Artificial Intelligence (RNIA)*, Cuernavaca, Morelos, Mexico, September **1995**.

Abstracts and Posters

1. Emerson Jassan Olaya and Luz Abril Torres-Méndez.
   Diseño de un sistema de visión activo inspirado biológicamente.
   In the *3rd Intl. Conf. on Multidisciplinary Research.* Saltillo, Mexico. 15-16 Octubre, **2009**.
2. Luz Abril Torres-Mendez and Gregory Dudek.
   Inter-Image Statistics for Scene Reconstruction
   In *Precarn/IRIS Proceedings*, Ottawa, Canada, 1 page, June **2004**.
3. Luz Abril Torres-Mendez and Gregory Dudek.
   Range Synthesis for Mobile Robot Environment Modeling.
   In *Precarn/IRIS Proceedings*, Calgary, Canada, 1 page, June **2003**.
4. Luz Abril Torres-Mendez and Gregory Dudek.
   Sensor Fusion for 3-D Modeling of Indoor Environments.
   In *Precarn/IRIS Proceedings*, Ottawa, Canada, 1 page, May **2001**.

HUMAN RESOURCES

PhD students:

1. Ricardo Ramón Pérez Alcocer (**in progress**).
   Thesis: "A visual-servoing navigation system for aquatic robot guidance."

MSc. students:

1. Roberto Cervantes Jacobo (**in progress**)
   Thesis: "Learning navigation human behaviors for indoor mobile robot navigation."
2. Armando Martínez Lugo (**in progress**)
   Thesis: "3D object reconstruction using structured light and artificial vision."
3. Martha Lorena Quiñones Muñoz, Febrero 24, **2012**.
   Thesis: "A simulation graphical tool for evaluating the distribution of cameras in indoor environments."
4. Mara Griselda Ortiz Alvarado, Agosto 31, **2011**.
   Thesis: "Multi-sensorial active perception for 3D environment modeling using non-parametric belief propagation."
5. Jocelyn Miranda Hernández, Febrero 28, **2011**.
   Thesis: "Face Color Synthesis Using Partial Least Squares and the $L\alpha\beta$ Color Transform."
6. Emerson Jassan Olaya Benítez, Julio 5, **2010**.
   Thesis: "Design and construction of a biological-inspired active vision system for depth estimation and tracking of moving objects."
7. Sergio Antonio Rosales Morales, Junio 15, **2009**.
   Thesis: "Reconstruction of tridimensional maps based on a statistical characterization of visual cues."

Undergraduate:

1. Mario Suárez Cortez, Agosto, 2009.
2. Albertano Garca Nolasco, Octubre, 2008.