

# Curriculum Vita

## Dah-Jye Lee

Professor  
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## Education

<b>Shenandoah University, Winchester, VA</b>	MBA	1999
<i>Project/Product Cost Analysis and Organizational Behaviors</i>		
<b>Texas Tech University, Lubbock, TX</b>	Ph.D. E.E.	1990
<i>Depth Information from Image Sequences Using 2-D Cepstrum</i>		
<b>Texas Tech University, Lubbock, TX</b>	M.S. E.E.	1987
<i>Image Registration Using Spectrum and Cepstrum Techniques</i>		
<b>National Taiwan University of Science and Technology</b>	B.S. E.E.	1984
<b>National Taipei University of Technology</b>	A.S. E.E.	1979

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## Professional Background

### Brigham Young University, Provo, Utah

Professor - Department of Electrical and Computer Engineering	2009~ present
Associate Professor - Department of Electrical and Computer Engineering	2001~ 2009
Director – Robotic Vision Laboratory ( <a href="https://rvl.byu.edu">https://rvl.byu.edu</a> )	2004~ present

### Robotics Vision System, Inc. (RVSI) - Electronics, Hauppauge, New York

Director of Vision Technology	2000 ~ 2001
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### Agri-Tech, Inc., Woodstock, Virginia

Vice President of Research and Development	1998 ~ 2000
Research and Development Manager	1996 ~ 1998

### Texas Instruments, Inc., Dallas, Texas

Senior Systems Engineer	1995 ~ 1996
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### Innovision Corporation, Madison, Wisconsin

Staff Scientist & Vision Project Manager	1990 ~ 1995
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### Texas Tech University, Lubbock, Texas

Research Associate, Instructor and Teaching Assistant - Department of Electrical Engineering	1985 ~ 1990
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## Other Work Experience

<b>Nanfeng College of Sun Yat-sen University, Guangzhou, Guangdong, China</b>	May 2017 ~ May 2021
Electrical and Computer Engineering - Adjunct Professor	
<b>SYSU-CMU Shunde International Joint Research Institute, Foshan, Guangdong, China</b>	May ~ Dec. 2017
Senior Research Fellow & Visiting Professor	
<b>Smart Vision Works, Inc.</b> ( <a href="http://www.smartvisionworks.com">http://www.smartvisionworks.com</a> )	April 2012 ~
Cofounder	
<b>Chaoyang University of Technology, Taichung, Taiwan</b>	2008 and 2017
Graduate Institute of Networking and Communication Engineering - Adjunct Professor	
<b>Smart Vision Works AF, LLC.</b>	June 2006 ~ June 2022
Founder and President	
<b>National Library of Medicine, National Institutes of Health, Bethesda, MD</b>	Summer 2002
Biomedical Informatics Training Program, Visiting Faculty	
<b>CS Technologies</b>	June 1996 ~ June 2006
Founder and President	

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## Honor and Awards

- Brigham Young University, Inspiring Learning Award (2022)
- Michigan Invasive Carp Challenge, Fourth Place (out of 353 from 27 countries) (2018)
- Brigham Young University, ECEn Outstanding Faculty Teaching Award (2017)

- Brigham Young University Student Association Best Faculty Advisor (2005)
- SPIE Intelligent Robot and Computer Vision Conference Best Student Paper Award (2005)
- Advised 3 students to receive Brigham Young University ORCA Mentoring Grants (2003, 2005, 2009)
- IEEE Industrial Electronics Conference Best Paper Presentation (2003)
- Texas Tech University Electrical Engineering Academy (2002)

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## Professional Activities

### Editor and Editorial Board

- Editor – International Journal of Applied Science and Engineering (2022~)
- Editorial Board Member – Electronics (2018~)
- Section Board for Artificial Intelligence Circuits and Systems.- Electronics (2020~)
- Guest Editor – "[Convolutional Neural Networks and Vision Applications](#)" (2019)
- Guest Editor - "[Convolutional Neural Network Design and Hardware Implementation for Real-Time Vision Applications](#)" (2018)
- Associate Editor & Editorial Board Member – International Journal of Advanced Robotic Systems (2012~)
- Steering Committee - IEEE Symposium on Computer Based Medical Systems (CBMS) (2003~)
- Associate Editor & Editorial Board Member – The Scientific World Journal (2013~2016)
- Editorial Board Member – Conference Papers in Signal Processing Journal (2012~2015)
- Editor - Proceedings of IEEE Symposium on Computer Based Medical Systems (2003, 2004, 2006, 2008, 2009)

### Proposal Reviewer and Panel Member

- Austrian Science Fund (FWF) (2021)
  - USDA Small Business Innovation Research (2001~2004, 2012, 2015)
  - New Zealand Ministry of Business, Innovation, and Employment (2013)
  - USDA NIFA Secondary Post-Secondary Panel (2013)
  - New Zealand Ministry of Science and Innovation (2012)
  - NSF Theoretical Foundation Signal Processing Panel (2005)
  - NSF Information System Sensor Nets Panel (2003)
  - U.S. Civilian Research and Development Foundation (CRDF) (2003)
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## Research Activities

### Research Interests

Artificial intelligence, high-performance visual computing, robotic vision, and visual inspection automation.

**Total Research Funding Since Joining BYU in 2002:** \$3,349,476 (external: \$3,127,776, BYU internal: \$221,700)

**External Research Funding, Donations, and Matching Funds** (Total grant proposals submitted since 2002: 116)

- Funded Research Projects
- 23. Co-PI, "Flare and Control for Ultra High Destruction and Removal Efficiency", US Department of Energy ARPA-E, Subcontract from Cimarron, Inc, April 2022-April 2023 (#DE-AR0001530)
- 22. PI, "Artificial Intelligence for Detection of Foreign Materials in Food Products", Smart Vision Works, Inc., June 2021-August 2022 (100% to BYU)
- 21. PI, "Machine Learning Methods Application for Analyzing Hydro-Acoustic Telemetry Data", US Geological Survey, July 2018-Dec. 2019 (100% to BYU) (#G18AC00158)
- 20. PI, "Demonstration of Ultra Low Latency Object Tracking for Multi-Focal Length Camera Arrays", Flight Test Group, Defense Technologies Engineering Division, Lawrence Livermore National Laboratories, July 2018-Aug. 2019 (100% to BYU) (#B629134)
- 19. PI, "Evolutionary Learning for Visual Inspection Automation", Utah Technology Acceleration Grants, May 2017-Dec. 2018 (100% to BYU) (#172085)
- 18. PI, "Automated Archerfish EO / Sonar Detection Techniques for Naval Mines", DoD Navy, Subcontract from eCortex, Jan. 2017-Dec. 2019 (10% to BYU) (N00024-17-C-403005)
- 17. PI, "Improve Competitiveness of Specialty Crop Production through a New Product Quality Verification Method", US Department of Agriculture SBIR Phase II, Subcontract from Smart Vision Works International, LLC, Sep. 2015-Aug. 2018 (100% to BYU) (2015-33610-23786)
- 16. PI, "Vision-Based Automobile Pixel Lighting Control", On Semiconductor, Feb. 2015-Jun. 2015, (100% to BYU)
- 15. PI, "Improve Competitiveness of Specialty Crop Production through a New Product Quality Verification Method", US Department of Agriculture SBIR Phase I, Subcontract from Smart Vision Works International, LLC, May 2014-Jan. 2015 (100% to BYU)
- 14. PI, "Enhanced Large Mammal Detection and Real-time Mapping through the use of FLIR and High Definition Camera and Improved Geo-mapping System", Oil Sands Initiative Leadership, Feb. 2012 (100% to BYU)

13. PI, "Distributed Medical Image Processing Framework Using a Multi-processor Network Cluster", National Institutes of Health (NIH), National Library of Medicine (NLM), Sep. 2009-2010 (100% to BYU)
12. PI, "Distributed Medical Image Processing Framework Using Cell Processors", NIH, NLM, Sep. 2008-2009 (100% to BYU)
11. PI, "R&D in Query and Retrieval of Multiple Image Components with Spatial and Geometrical Constraints and API Development for Web-deployable CBIR", NIH, NLM, Sep. 2007-2008 (100% to BYU)
10. PI, "Automated EO/IR Detection Techniques For Floating Objects", DoD Navy, Subcontract from eCortex, Nov. 2006-Sep. 2007 (5% to BYU)
9. PI, "R&D and API Development for Web-deployable CBIR Techniques with Support for Spatial Geometrical Relationships", NIH, NLM, Sep. 2006-2007 (100% to BYU)
8. Co-PI, "FGPA Implementation of Real-time, High-Resolution, RGB Bayer Pattern Conversion for NTSC Video", Procerus Technologies, Apr.-Sep. 2006 (100% to BYU)
7. PI, "Feature Indexing and Relevance Feedback Techniques for Improved CBIR of Spine X-ray Images and Medical Validation of Spine X-ray Shapes", NIH, NLM, Sep. 2005- Feb. 2007 (100% to BYU)
6. PI, "Evaluation of Efficient Relevance Feedback Methods for Spine X-ray Image Retrieval", NIH, NLM, Sep. 2004-2005 (100% to BYU)
5. PI, "An Automated Fish Migration Pattern Monitoring System Using Shape Descriptors for Pattern Recognition", US Department of Agriculture, Subcontract from Agris-Schoenberger Vision Systems, Inc., Oct. 2004 – Feb. 2007 (40% to BYU)
4. Co-PI, "Bio-inspired Image Directed Control of Mars Flyers", Jet Propulsion Lab and NASA Ames Research Center, Apr.-Dec. 2004 (100% to BYU)
3. PI, "Partial Shape Matching Techniques for Spine X-ray Images", NIH, NLM, Sep. 2003-2004 (100% to BYU)
2. PI, "An Automated Fish Migration Pattern Monitoring System Using Shape Descriptors for Pattern Recognition", US Department of Agriculture, Subcontract from Agris-Schoenberger Vision Systems, Inc., May 2003-Nov. 2003 (33% to 3 BYU Faculty)
1. PI, "Fish Species Classification", US Bureau of Reclamation, May-Oct. 2002 (100% to BYU)
- External Donations and Matching Funds (Total donation: \$166,057)
8. Sony Electronics.
7. Smart Vision Works, LLC. (SVW)
6. The Center for Autonomous Vehicle Applied Technology and Information (CAVATI)
5. Micron Technology and Sandia National Laboratories
4. Agris-Schoen Vision Systems, Inc. (ASVS)
3. National Institutes of Health Summer Training Program
2. LogoMetrix, Inc. and TigerLight. Inc.
1. Autoliv, Inc. and Datepac, LLC.

#### **BYU Internal Research Funding (Total BYU internal funding: \$221,700)**

7. College of Engineering and Technology
6. 2 BYU Office of Research and Creative Activities Mentoring Environment Grants
5. BYU Office of Academic Internship
4. BYU Office of Graduate Studies Graduate Mentoring Award
3. Huber Graduate Scholarship 2005 to 2007
2. Embedded System Center for IGVC competition
1. Schafer Scholarship for IGVC competition

### **Publications and Inventions**

#### **Book Chapters (Names underlined are student authors)**

2. G.M Xiong, L. Gao, S.B. Wu, Y.N. Zhao, and D.J. Lee, "*Intelligent Behaviors and Test and Evaluation for Unmanned Ground Vehicles*", **Beijing Institute of Technology**, Beijing, China, November, 2015.
1. D.J. Lee, J.K. Archibald, R.B. Schoenberger, A.W. Dennis, and D.K. Shiozawa, "*Contour Matching for Fish Species Recognition and Migration Monitoring*", **Applications of Computational Intelligence in Biology: Current Trends and Open Problems**, Springer-Verlag, ISBN: 978-3-540-78533-0, vol. 122, p. 183-207, June 2008.

#### **Referred Journal Publications (Student authors are underlined, SCI: 25, SCIE: 43, EI: 3, Others: 7)**

83. Z. Sun, A.W. Sumsion, S.A. Torrie, Lily Prusso, and D. J. Lee, "*Improving Identity Verification with Facial Motion Password*", "**Multimedia Tools and Applications**", (Submitted on 06/07/2022)
82. Z. Sun, A.W. Sumsion, S.A. Torrie, and D. J. Lee, "*Learning Facial Motion Representation with a Lightweight Encoder for Identity Verification*", "**Electronics**", (Submitted on 05/27/2022)
81. C.L. Chi, D. Zhang, Z.S. Zhu, X.Z. Wang, and D.J. Lee, "*Human pose estimation based on 1-D heatmaps and offset regression for low-resolution image*", "**Multimedia Tools and Applications**", (Revised on 06/05/22)

80. Z.S. Zhu, D. Zhang, C.L. Chi, M. Li, and D.J. Lee, "A Complementary Dual-branch Network for Appearance-based Gaze Estimation from Low-resolution Facial Images," *IEEE Transactions on Cognitive and Developmental Systems*, (Submitted on 03/25/22)
79. X.Z. Wang, D. Zhang, H.Z. Tan, and D.J. Lee, "A Contrastive Learning Based Self-Fusion Network for Group Emotion Recognition," *IEEE Transactions on Computational Social Systems*, (Submitted on 02/20/22). (SCIE)
78. J.C. Hsu, F.H. Wu, H.H. Lin, D.J. Lee, Y.F. Chen, and C.S. Lin, "[Models for Predicting Readmission of Pneumonia Patients after Discharge](#)", *Electronics*, vol. 11(5), pp. 673-22 pages, February 2022 (SCIE)
77. W. Zou, D. Zhang, and D.J. Lee, "[A New Multi-feature Fusion based Convolution Neural Network for Facial Expression Recognition](#)", *Applied Intelligence*, vol. 52(3), pp. 2918-2929, February 2022. (SCI)
76. X. Li, D. Zhang, M. Li, and D.J. Lee, "[Using Image Rectification and Lightweight Convolutional Neural Network for Accurate Head Pose Estimation](#)", *IEEE Transactions on Multimedia*, (Online on 01/26/22). (SCI)
75. J. Chai, D.J. Lee, B.J. Tippetts, and K.D. Lillywhite, "[Implementation of An Award-Winning Invasive Fish Recognition and Separation System](#)", *Electronics*, vol. 10(17), pp. 2182-13 pages, September 2021. (SCIE)
74. J.N. Teng, D. Zhang, W. Zou, M. Li, and D.J. Lee, "[Typical Facial Expression Network Using Facial Feature Decoupler and Spatial-Temporal Learning](#)", *IEEE Transactions on Affective Computing*, (Online on 08/07/21). (SCIE)
73. T.S. Simons and D.J. Lee, "[Efficient Binarized Convolutional Layers for Visual Inspection Applications on Resource Limited FPGAs and ASICs](#)", *Electronics*, vol. 10(13), pp. 1511-16 pages, June 2021. (SCIE)
72. W.C. Chen, D. Zhang, M. Li, and D.J. Lee, "[STCAM: Spatial-Temporal and Channel Attention Module for Dynamic Facial Expression Recognition](#)", *IEEE Transactions on Affective Computing*, (Online on 09/29/20). (SCIE)
71. M. Yu, D. Zhang, D.J. Lee, and A. Desai, "SR-SYBA: A Scale and Rotation Invariant Synthetic Basis Feature Descriptor with Low Memory Usage", *Electronics*, vol. 9(5), pp. 810-20pages, May 2020. (SCIE)
70. Z.H. Guo, M. Zhang, D.J. Lee, and T.S. Simons, "Smart Camera for Quality Inspection and Grading of Food Products", *Electronics*, vol. 9(3), pp. 505-18pages, March 2020. (SCIE)
69. D.J. Lee, S.G. Fuller, and A.S. McCown, "Optimization and Implementation of Synthetic Basis Feature Descriptor on FPGA", *Electronics*, vol. 9(3), pp.391-21 pages, March 2020. (SCIE)
68. Y.Y. Li, D. Zhang, and D. J. Lee, "IIRNet: A Lightweight Deep Neural Network Using Intensely Inverted Residuals for Image Recognition", *Image and Vision Computing*, vol. 92, Article# 103819, December 2019. (SCIE)
67. Z.H. Guo, M. Zhang, and D.J. Lee, "Efficient Evolutionary Learning Algorithm for Real-Time Embedded Vision Applications", *Electronics*, vol. 8(11), pp.1367-18 pages, November 2019. (SCIE)
66. X.K. Miao and D.J. Lee, "Just Noticeable Difference Binary Pattern for Reduced Reference Image Quality Assessment", *Optical Engineering*, vol. 58(9), pp. 093105 13 pages, September 2019. (SCI)
65. Y.F. Chen, C.S. Lin, C.F. Hong, D. J. Lee, C.M. Sun, H.H. Lin, "Design of a Clinical Decision Support System for Predicting Erectile Dysfunction in Men Using NHIRD Dataset", *IEEE Journal of Biomedical and Health Informatics*, vol. 23(5), pp. 2127 – 2137, September 2019. (SCI)
64. D. Zhang, L.A. Raven, D.J. Lee, Meng Yu, and A. Desai, "Hardware Friendly Robust Synthetic Basis Feature Descriptor", *Electronics*, vol. 8(8), pp. 847-19 pages, July 2019 (SCIE)
63. T.S. Simons and D.J. Lee, "A Review of Binarized Neural Networks", *Electronics*, vol. 8(6), pp. 661-25 pages, June 2019. (SCIE)
62. T.S. Simons and D.J. Lee, "Jet Features: Hardware-Friendly, Learned Convolutional Kernels for High-Speed Image Classification", *Electronics*, vol. 8(5), pp. 588-20 pages, May 2019. (SCIE)
61. J.N. Teng, D. Zhang, D.J. Lee, "Recognition of Chinese Food Using Convolutional Neural Network", *Multimedia Tools and Applications*, vol. 78(9), pp. 11155-11172, May 2019. (SCIE)
60. Y.Y. Li, D. Zhang, and D. J. Lee, "Automatic Fabric Defect Detection with a Wide-And-Compact Network", *Journal of Neurocomputing*, vol. 329, pp. 329-338, February 2019. (SCIE)
59. D. Zhang, A. Desai, and D.J. Lee, "[Using Synthetic Basis Feature Descriptor for Motion Estimation](#)", *International Journal of Advanced Robotic Systems*, vol. 15/5, 13 pages, October 2018. (SCIE)
58. Y. Han, Z.G. Liu, D.J. Lee, W.Q. Liu, J.W. Chen, and Z.W. Han, "Rod-Insulator Defect Detection in High-speed Railway Catenary System Using DPMs and Local Period Estimation", *International Journal of Advanced Robotic Systems*, 15 pages, May 2018. (SCIE)
57. Y.F. Chen, C.S. Lin, K.A. Wang, L.O.A. Rahman, D.J. Lee, W.S. Chung, and H.H. Lin, "Design of a Clinical Decision Support System for Fracture Prediction Using Imbalanced Dataset", *Journal of Healthcare Engineering*, vol. 2018, Article ID: 9621640, 13 Pages, March 2018. (SCIE)
56. A. Desai and D.J. Lee, "Efficient Feature Descriptor for Unmanned Aerial Vehicle Ground Moving Object Tracking," *AIAA Journal of Aerospace Information Systems*, vol. 14/6 : p. 345-349, June 2017. (SCIE)
55. M. Zhang, D.J. Lee, K.D. Lillywhite, and B.J. Tippetts, "Automatic Quality and Moisture Evaluations Using Evolution Constructed Features," *Computers and Electronics in Agriculture*, vol. 135, p. 321-327, April 2017. (SCIE)
54. A. Desai and D.J. Lee, "Visual Odometry Drift Reduction Using SYBA Descriptor and Feature Transformation," *IEEE Transactions on Intelligent Transportation Systems*, vol. 17/7, p. 1839-1851, July 2016. (SCI)
53. D. Zhang, D.J. Lee, M. Zhang, B.J. Tippetts, and K.D. Lillywhite, "Object Recognition Algorithm for the Automatic Identification and Removal of Invasive Fish," *Biosystems Engineering*, vol. 145, p. 65-75, May 2016. (SCI)



52. A. Desai, D.J. Lee, and D. Ventura, "An Efficient Feature Descriptor Based on Synthetic Basis Functions and Uniqueness Matching Strategy", **Computer Vision and Image Understanding**, vol. 142, p. 37-49, January 2016. (SCI)
51. B.J. Tippetts, D.J. Lee, K.D. Lillywhite, and J.K Archibald, "Review of Stereo Vision Algorithms and their Suitability for Resource Limited Systems", **Journal of Real-Time Image Processing**, vol. 11/1, p. 5-25, January 2016. (SCIE)
50. D. Zhang, K.D. Lillywhite, D.J. Lee, and B.J. Tippetts, "Automated Fish Taxonomy using Evolution-Constructed Features for Invasive Species Removal", **Pattern Analysis and Applications**, vol. 18/2, p. 451-459, May 2015. (SCIE)
49. B.J. Tippetts, D.J. Lee, K.D. Lillywhite, and J.K Archibald, "Efficient Stereo Vision Algorithms for Resource Limited Systems", **Journal of Real-Time Image Processing**, vol. 10/1, p. 163-174, March 2015. (SCIE)
48. S.G. Fowers, A. Desai, D.J. Lee, D. Ventura, and J.K Archibald, "Tree-Based Feature Descriptor and Its Hardware Implementation", **International Journal of Reconfigurable Computing**, vol. 2014, Article ID 606210, 12 pages, November 2014. (EI)
47. D. Zhang, D.J. Lee, B.J. Tippetts, and K.D. Lillywhite, "Date Quality Evaluation Using Short-wave Infrared Imaging", **Journal of Food Engineering**, vol. 141, p. 74-84, November 2014. (SCI)
46. S.G. Fowers, A. Desai, D.J. Lee, D. Ventura, and D.K. Wilde, "Efficient Tree-Based Feature Descriptor and Matching Algorithm", **AIAA Journal of Aerospace Information Systems**, vol. 11/9, p. 596-606, September 2014. (SCIE)
45. Y.H. Jiang, G.M. Xiong, H.Y. Chen, and D.J. Lee, "Incorporating a Wheeled Vehicle Model in a New Monocular Visual Odometry Algorithm for Dynamic Outdoor Environments", **Sensors**, vol. 14/9, p. 16159-16180, September 2014. (SCIE)
44. D. Zhang, D.J. Lee, B.J. Tippetts, and K.D. Lillywhite, "Date Maturity and Quality Evaluation Using Color Distribution Analysis and Back Projection", **Journal of Food Engineering**, vol. 131, p. 161-169, June 2014. (SCI)
43. D. Zhang, D.J. Lee, and B. Taylor, "Seeing Eye Phone: A Smart Phone-based Indoor Guidance System for the Visually Impaired," **Machine Vision and Applications Journal**, vol. 25/3, p. 811-822, April 2014. (SCIE)
42. B.J. Tippetts, D.J. Lee, K.D. Lillywhite, J.K Archibald, "Hardware-efficient Design of Real-time Profile Shape Matching Stereo Vision Algorithm on FPGA", **International Journal of Reconfigurable Computing**, vol. 2014, Article ID 945926, 12 pages, February 2014. (EI)
41. D. Zhang, D.J. Lee, and Y.P. Chang, "A New Profile Shape Matching Stereo Vision Algorithm for Real-time Human Pose and Hand Gesture Recognition", **International Journal of Advanced Robotic Systems**, vol. 11, February 2014. (SCIE)
40. D. Zhang, K.D. Lillywhite, D.J. Lee, and B.J. Tippetts, "Automatic Shrimp Shape Grading Using Evolution Constructed Features", **Computers and Electronics in Agriculture**, vol. 100, p. 116-122, January 2014. (SCIE)
39. K.D. Lillywhite, D.J. Lee, B.J. Tippetts, and J.K Archibald, "A Feature Construction Method for General Object Recognition", **Pattern Recognition**, vol. 46/12, p. 3300-3314, December 2013. (SCI)
38. D. Zhang, K.D. Lillywhite, D.J. Lee, and B.J. Tippetts, "Automated Apple Stem End and Calyx Detection using Evolution-Constructed Features," **Journal of Food Engineering**, vol. 119/3, p. 411-418, December 2013. (SCI)
37. S.G. Fowers, D.J. Lee, D. Ventura, and B.J. Tippetts, "Novel Feature Descriptor for Low-Resource Embedded Vision Sensors for Micro-UAV Applications", **AIAA Journal of Aerospace Information Systems**, vol. 10/ 8, p. 385-395, August 2013. (SCIE)
36. S.G. Fowers, D.J. Lee, D. Ventura, and J.K Archibald, "The Nature Inspired BASIS Feature Descriptor for UAV Imagery and Its Hardware Implementation", **IEEE Transactions on Circuits and Systems for Video Technology**, vol. 23/5, p. 756-768, May 2013. (SCI)
35. B.J. Tippetts, D.J. Lee, and J.K Archibald, "An On-Board Vision Sensor System for Small Unmanned Vehicle Applications", **Machine Vision and Applications Journal**, vol. 23/3, p. 405-413, May 2012. (SCIE)
34. K.D. Lillywhite, B.J. Tippetts, and D.J. Lee, "Self-Tuned Evolution-Constructed Features for General Object Recognition", **Pattern Recognition**, vol. 45/1, p. 241-251, January 2012. (SCI)
33. S.G. Fowers and D.J. Lee, "An Effective Color Addition to Feature Detection and Description for Book Spine Image Matching", **International Scholarly Research Network-Machine Vision**, vol. 2012, Article ID 945973, 15 pages, January 2012.
32. B.J. Tippetts, D. J. Lee, J.K Archibald, and K.D. Lillywhite, "Dense Disparity Real-time Stereo Vision Algorithm for Resource Limited Systems", **IEEE Transactions on Circuits and Systems for Video Technology**, vol. 21/10, p. 1547-1555, October 2011. (SCI)
31. D.J. Lee, J.K Archibald, and G.M. Xiong, "Rapid Color Grading for Fruit Quality Evaluation Using Direct Color Mapping", **IEEE Transactions on Automation Science and Engineering**, vol. 8/2, p. 292-302, April 2011. (SCI)
30. Z.Y. Wei, D.J. Lee, B.E. Nelson, and J.K Archibald, "Hardware-Friendly Vision Algorithms for Embedded Obstacle Detection Applications", **IEEE Transactions on Circuits and Systems for Video Technology**, vol. 20/11, p. 1577-1589, November 2010. (SCI)
29. G.M. Xiong, D.J. Lee, K.R. Moon, and R.M. Lane, "Shape Similarity Measure Using Turn Angle Cross-correlation for Oyster Quality Evaluation", **Journal of Food Engineering**, vol. 100/1, p. 178-186, September 2010. (SCI)
28. J.M. Bodily, B.E. Nelson, Z.Y. Wei, D.J. Lee, and J. Chase, "A Comparison Study On Implementing Optical Flow and Digital Communications on FPGAs and GPUs", **ACM Transactions on Reconfigurable Technology and Systems**, vol. 3/2, Article 6, 22 pages, May 2010. (SCIE)

27. D.J. Lee, P.C. Merrell, Z.Y. Wei, and B.E. Nelson, "Two-Frame Structure from Motion Using Optical Flow Probability Distributions for Unmanned Air Vehicle Obstacle Avoidance", **Machine Vision and Applications Journal**, vol. 21/3, p. 229-240, April 2010. (SCIE)
26. D.J. Lee, S.K. Antani, Y.C. Chang, K. Gledhill, L.R. Long, and P. Christensen, "CBIR of Spine X-ray Images on Inter-vertebral Disc Space and Shape Profiles", special issue on "Knowledge Discovery in Medicine", **Data & Knowledge Engineering Journal**, vol. 68/12, p. 1359-1369, December 2009. (SCIE)
25. B.J. Tippetts, D. J. Lee, S.G. Fowers, and J.K. Archibald, "Real-Time Vision Sensor for an Autonomous Hovering Micro Unmanned Aerial Vehicle", **AIAA Journal of Aerospace Computing, Information, and Communication**, vol. 6, p. 570-584, October 2009. . (SCIE)
24. G.H. Chang, G.J. Kerns, D.J. Lee, and G.L. Stanek, "Calibration Experiments for a Computer Vision Oyster Volume Estimation System", **Journal of Statistics Education**, vol. 17/2, 20 pages, July 2009.
23. D. Zhang, J.Q. Ni, and D.J. Lee, "Security Analysis on Add-SS Watermarking with GSM", **ACTA Automatica SINICA**, vol. 35/7, p. 841-850, July 2009.
22. X.Q. Xu, D.J. Lee, S.K. Antani, L.R. Long, and J. K. Archibald, "Using Relevance Feedback with Short-term Memory for Content-based Spine X-ray Image Retrieval", **Journal of Neurocomputing**, vol. 72/10-12, p. 2259-2269, June 2009. (SCIE)
21. D.J. Lee, P.C. Merrell, B.E. Nelson, and Z.Y. Wei, "Multi-Frame Structure from Motion using Optical Flow Probability Distributions", **Journal of Neurocomputing**, vol. 72/4-6, p. 1032-1041, January 2009. (SCIE)
20. D.J. Lee, J.K. Archibald, Y.C. Chang, and C.R. Greco, "Robust Color Space Conversion and Color Distribution Analysis Techniques for Date Maturity Evaluation", **Journal of Food Engineering**, vol. 88/3, p. 364-372, October 2008. (SCI)
19. X. Xi, K. Ueno, E. Keogh, and D.J. Lee, "Converting Non-parametric Distance-Based Classification to Anytime Algorithms", special issue on "Non-parametric Distance-based Classification Techniques and their Applications" of **Pattern Analysis and Applications**, vol. 11/3-4, p. 321-336, September 2008. (SCIE)
18. Z.Y. Wei, D.J. Lee, B.E. Nelson, J.K. Archibald, and B.B. Edwards, "FPGA-Based Embedded Motion Estimation Sensor", **International Journal of Reconfigurable Computing**, vol. 2008, Article ID 636145, 8 pages, July 2008. (EI)
17. Y.C. Chang, D.J. Lee, Y. Hong, J.K. Archibald and D. Liang, "A Robust Color Image Quantization Algorithm Based on Knowledge Reuse of K-Means Clustering Ensembles", **Journal of Multimedia**, vol. 3/2, p. 20-27, June 2008.
16. D.J. Lee, J.D. Anderson, and J.K. Archibald, "Hardware Implementation of Spline-based Genetic Algorithm for Embedded Stereo Vision Sensor Providing Real-time Visual Guidance to the Visually Impaired", special issue on "Signal Processing for Applications in Healthcare Systems (AHS)" of the **EURASIP Journal on Advances in Signal Processing**, vol. 2008, 10 pages, June 2008. (SCIE)
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**Conference Proceedings and Presentations** (abstract or summary submission, full-paper proceedings)

38. J.J. Liu, J.D. Newman, and D.J. Lee, "*Using Artificial Intelligence to Provide Visual Feedback for Golf Swing Training*", SPIE Electronic Imaging, Intelligent Robotics and Industrial Applications using Computer Vision, No. 321, Virtual, January 11, 2021.
37. Z. Sun, D. J. Lee, D. Zhang, and X. Li, "*Concurrent Two-factor Identity Verification Using Facial Identity and Facial Actions*", SPIE Electronic Imaging, Intelligent Robotics and Industrial Applications using Computer Vision, No. 318, Virtual, January 11, 2021.
36. J.D. Newman, J.W. Lin, D. J. Lee, and J.J. Liu, "*Automatic Annotation of American Football Video Footages for Game Strategy Analysis*", SPIE Electronic Imaging, Intelligent Robotics and Industrial Applications using Computer Vision, No. 303, Virtual, January 11, 2021.
35. D. Zhang, D.J. Lee, and A. Desai, "*Color Back Projection for Date Maturity Evaluation*", SPIE Electronic Imaging, Intelligent Robots and Computer Vision XXX: Algorithms and Techniques, vol. 9025-34, San Francisco, CA, USA, February 2-6, 2014.
34. A. Desai and D.J. Lee, "*Using Probabilistic Model as Feature Descriptor on a Smartphone Device for Autonomous Navigation of Unmanned Ground Vehicles*", SPIE Electronic Imaging, Intelligent Robots and Computer Vision XXX: Algorithms and Techniques, vol. 9025-18, San Francisco, CA, USA, February 2-6, 2014.
33. D. Zhang, D.J. Lee, and A. Desai, "*Using Short-wave Infrared Imaging for Fruit Quality Evaluation*", SPIE Electronic Imaging, Intelligent Robots and Computer Vision XXX: Algorithms and Techniques, vol. 9025-10, San Francisco, CA, USA, February 2-6, 2014.
32. Y.P. Chang, D.J. Lee, J.A. Moore, A. Desai, and B.J. Tippetts, "*Finger Tracking for Hand-held Device Interface Using Profile-matching Stereo Vision*", SPIE Electronic Imaging, Intelligent Robots and Computer Vision XXX: Algorithms and Techniques, San Francisco, CA, USA, February 3-7, 2013.
31. A. Desai, D.J. Lee, J.A. Moore, and Y.P. Chang, "*Stabilization and Control of a Quad-Rotor Helicopter Using Smartphone Device*", SPIE Electronic Imaging, Intelligent Robots and Computer Vision XXX: Algorithms and Techniques, San Francisco, CA, USA, February 3-7, 2013.
30. B.J. Tippetts, D.J. Lee, and J.K. Archibald, "*Fast Correspondence of Unrectified Stereo Images using Genetic Algorithm and Spline Representation*", SPIE Electronic Imaging, Intelligent Robots and Computer Vision XXVII: Algorithms and Techniques, vol. 7539, 75390W1-8, San Jose, CA, USA, January 17-21, 2010.
29. S.G. Fowers, K.D. Lillywhite, D.J. Lee, and D.K. Wilde, "*Color DoG: A Three-Channel Color Feature Detector for Embedded Systems*", SPIE Electronic Imaging, Intelligent Robots and Computer Vision XXVII: Algorithms and Techniques, vol. 7539, 75390X1-9, San Jose, CA, USA, January 17-21, 2010.
28. D.J. Lee, and J.K. Archibald, "*Color Image Processing for Date Quality Evaluation*", SPIE Electronic Imaging, Intelligent Robots and Computer Vision XXVII: Algorithms and Techniques, vol. 7539, 75390V1-12, San Jose, CA, USA, January 17-21, 2010.
27. S.G. Fowers, B.J. Tippetts, D.J. Lee, and J.K. Archibald, "*Vision-guided Autonomous Quad-rotor Helicopter Flight Stabilization and Control*", AUVSI's Unmanned Systems North America 2008, San Diego, CA, USA, June 10 -12, 2008.
26. K.D. Lillywhite, D.J. Lee, B.J. Tippetts, S.G. Fowers, A.W. Dennis, B.E. Nelson, and J.K. Archibald, "*An Embedded Vision System for an Unmanned Four-rotor Helicopter*", SPIE Optics East, Intelligent Robots and Computer Vision XXIV: Algorithms, Techniques, and Active Vision, vol. 6384, 63840G, Boston, MA, USA, October 1-4, 2006.
25. B.B. Edwards, W.S. Fife, J.K. Archibald, D.J. Lee, and D.K. Wilde, "*A Design Approach for Small Vision-based Autonomous Vehicles*", SPIE Optics East, Intelligent Robots and Computer Vision XXIV: Algorithms, Techniques, and Active Vision, vol. 6384, 63840L, Boston, MA, USA October. 3-4, 2006.
24. B.J. Tippetts, K.D. Lillywhite, S.G. Fowers, A.W. Dennis, D.J. Lee, and J.K. Archibald, "*A Simple, Inexpensive, and Effective Implementation of a Vision Guided Autonomous Robot*", SPIE Optics East, Intelligent Robots and Computer Vision XXIV: Algorithms, Techniques, and Active Vision, vol. 6382, 63820P, Boston, MA, USA, October 1-4, 2006.
23. J.D. Anderson, D.J. Lee, R.B. Schoenberger, and B.J. Tippetts, "*Using Real-time Vision to Control a Convoy of Semi-Autonomous Unmanned Vehicle*", AUVSI's Unmanned Systems North America, online proceedings, Orlando, FL, USA, August 29-31, 2006.
22. J.D. Anderson, D.J. Lee, R.B. Schoenberger, Z.Y. Wei, and J.K. Archibald, "*Semi-Autonomous Unmanned Ground Vehicle Control System*", SPIE International Symposium on Defense and Security, Intelligent Computing: Theory and Applications III, vol. 6230, 62301M, Orlando, FL, USA, April 17-21, 2006.
21. C. Archibald, E.S. Millar, J.D. Anderson, J.K. Archibald, and D.J. Lee, "*A Simple Approach to a Vision-guided Unmanned Vehicle*", SPIE Optics East, Robotics Technologies and Architectures, Intelligent Robots and Computer Vision XVIII, vol. 6006, p. 210-220, Boston, MA, USA, October 23-26, 2005.

20. J.D. Anderson, D.J. Lee, and J.K. Archibald, "FPGA Implementation of Vision Algorithms for Small Autonomous Robots", SPIE Optics East, Robotics Technologies and Architectures, Intelligent Robots and Computer Vision XVIII, vol. 6006, p. 401-411, Boston, MA, USA, October 23-26, 2005.
19. P.C. Merrell and D.J. Lee, "Structure from Motion Using Optical Flow Probability Distributions", SPIE International Symposium on Defense and Security, Intelligent Computing: Theory and Applications III, vol. 5803, p. 39-48, Orlando, FL, USA, March 28-April 1, 2005.
18. P.C. Merrell, D.J. Lee, and R.W. Beard, "Obstacle Avoidance for Unmanned Air Vehicles Using Optical Flow Probability Distributions", SPIE Optics East, Robotics Technologies and Architectures, Mobile Robot XVII, vol. 5609, p. 13-22, Philadelphia, PA, USA, October 25-28, 2004.
17. D.J. Lee, R.W. Beard, P.C. Merrell, and P. Zhan, "See and Avoidance Behaviors for Autonomous Navigation", SPIE Optics East, Robotics Technologies and Architectures, Mobile Robot XVII, vol. 5609, p. 23-34, Philadelphia, PA, USA, October 25-28, 2004.
16. D.J. Lee, X.Q. Xu, R.M. Lane, and P. Zhan, "Shape Analysis for an Automatic Oyster Grading System", SPIE Optics East, Two and Three-Dimensional Vision Systems for Inspection, Control, and Metrology II, vol. 5606, p. 27-36, Philadelphia, PA, USA, October 25-28, 2004.
15. D.J. Lee, R.B. Schoenberger, D.K. Shiozawa, X.Q. Xu, and P. Zhan, "Contour Matching for a Fish Recognition and Migration Monitoring System", SPIE Optics East, Two and Three-Dimensional Vision Systems for Inspection, Control, and Metrology II, vol. 5606, p. 37-48, Philadelphia, PA, USA, October 25-28, 2004.
14. P. Zhan, D.J. Lee, and R.W. Beard, "Solving Correspondence Problem Using 1-D Signal Matching", SPIE Optics East, Robotics Technologies and Architectures, Intelligent Robots and Computer Vision XXII, vol. 5608, p. 207-215, Philadelphia, PA, USA, October 25-28, 2004.
13. P. Merrell, D.J. Lee, and R.W. Beard, "Statistical Analysis of Multiple Optical Flow Values for Estimation of Unmanned Air Vehicles Height Above Ground", SPIE Optics East, Robotics Technologies and Architectures, Intelligent Robots and Computer Vision XXII, vol. 5608, p. 298-305, Philadelphia, PA, USA, October 25-28, 2004.
12. D.J. Lee, P. Zhan, A. Thomas, R.B. Schoenberger, "Shape-based Human Intrusion Detection", SPIE International Symposium on Defense and Security, Visual Information Processing XIII, vol. 5438, p. 81-91, Orlando, FL, USA, April 12-16, 2004.
11. D.J. Lee, B.P. Westover, and J.D. Eifert, "Three-dimensional Surface Approximation from Incomplete Data Using Distance Transform", SPIE Image Reconstruction from Incomplete Data II, vol. 4792, p. 125-134, Seattle, WA, USA, July 2002.
10. D.J. Lee, J.D. Eifert, and B.P. Westover, "Surface Area and Volume Measurement Using Radial Projections", SPIE Vision Geometry XI, vol. 4794, p. 92-100, Seattle, WA, USA, July 2002.
9. D.J. Lee, R.M. Lane, and G.H. Chang, "3-D Reconstruction for High-speed Volume Measurement", SPIE Machine Vision and Three-Dimensional Imaging Systems for Inspection and Metrology, vol. 4189, p. 258-267, Boston, MA, USA, November 2000.
8. D.J. Lee, "Color Space Conversion for Linear Color Grading", Proceedings of SPIE Intelligent Robots and Computer Vision XIX, vol. 4197, p. 358-366, Boston, MA, USA, November 2000.
7. D.J. Lee and R. Anbalagan, "3-D Measurement of Moving Objects Using a Multiple-camera Vision System", SPIE Computer Vision Applications, vol. 2549, p. 261-271, San Diego, CA, USA, July 1995.
6. D.J. Lee and R. Anbalagan, "High-speed Automated Color Sorting Vision System", SPIE Optical Engineering Midwest 1995, vol. 2622, p. 573-579, Chicago, IL, USA, April 1995.
5. D.J. Lee, M. Ramirez, and S. Mitra, "Fast 2-D Hartley Transform in 3-D Object Representation and Recognition", SPIE Advances in Intelligent Robotics Systems, vol. 1608, p. 302-314, Boston, MA, USA, November 1991.
4. D.J. Lee, S. Mitra, and T.F. Krile, "Accuracy of Depth Information from Cepstrum-Disparities of a Sequence of 2-D Projections", SPIE in Intelligent Robots and Computer Vision, vol. 1192, p. 778-788, Philadelphia, PA, USA, November 1989.
3. D.J. Lee, S. Mitra, and T.F. Krile, "A Hybrid Registration and Analysis Techniques for Sequential Complex Images", SPIE in Applied Digital Image Processing, vol. 1153, p. 193-202, San Diego, CA, August 1989.
2. D.J. Lee, S. Mitra, and T.F. Krile, "Noise Tolerance of Power Cepstra and Phase Correlation in Image Registration", Optical Society of America Meeting, Santa Clara, CA, USA, November 1988.
1. D.J. Lee, S. Mitra, and T.F. Krile, "Power Cepstrum in Registration of Noisy Images", Electronics Imaging 1988, Boston, MA, USA, October 1988.

#### Conference Presentations (presentation only, no proceedings)

5. R.M. Lane, D.J. Lee, and D. Zhang, "Separating and Sorting Shrimp for Market Grades, Quality and Uniformity with Machine Vision", Seafood Science Technology 36<sup>th</sup> Annual Conference and Trans-Atlantic Fisheries Technology Conference, Clearwater Beach, FL, USA, October 30-November 2, 2012.
4. D.J. Lee, P. Zhan, D.K. Shiozawa, and R.B. Schoenberger, "An Automated Fish Recognition and Migration Monitoring System for Biology Research", The 2004 Annual Meeting of the Western Division of the American Fisheries Society, Salt Lake City, UT, USA, March 1-4, 2004.



3. C. Strout, D.K. Shiozawa, and D.J. Lee, "Computerized Fish Imaging and Population Count Analysis", The 2004 Annual Meeting of the Western Division of the American Fisheries Society, Salt Lake City, UT, USA, March 1-4, 2004.
2. C. Dromey, D.J. Lee, S.G. Fletcher, D.M. Bates, and X. Xu, "Lip Shape Measures & Their Association With Tongue Contact Patterns", The American Speech-Language-Hearing Association Annual Convention, Chicago, IL, USA, November 2003.
1. J.D. Eifert, G.C. Sanglay, and D.J. Lee, "Prediction of Raw Produce Surface Area from Weight Measurement", Annual Meeting of the International Association for Food Protection, San Diego, CA, USA, July 2002.

### Invited Speeches

23. Seminar, "Self-Driving Cars and An In-Class Design Experience", National Taipei University of Technology (NTUT), Taipei, Taiwan, December 25, 2019.
22. Seminar, "Robotic Vision and Applications", National Taipei University of Technology (NTUT), Taipei, Taiwan, December 19, 2018.
21. Seminar, "Evolutionary Learning of Boosted Image Features", National Kaohsiung First University of Science and Technology (NKFUST), Kaohsiung, Taiwan, April 24, 2017.
20. Keynote Speech, "Evolutionary Learning of Boosted Image Features", 2017 International Conference on Advanced Information Technologies (AIT), Taichung, Taiwan, April 22, 2017.
19. Seminar, "Mobile Computer Vision and Its Applications", Jointed Research Institute, Sun Yat-sen University, Guangzhou, China, December 14, 2016.
18. Seminar, "Real-time Vision Algorithms for Resource Limited Systems", Sun Yat-sen University, Guangzhou, China, December 5, 2012.
17. Keynote Speech, "Real-time Vision Algorithms for Resource Limited Systems", 2008 International Conference on Advanced Information Technologies (AIT), Taichung, Taiwan, April 22, 2011.
16. Seminar, "Real-time Vision Algorithms for Resource Limited Systems", Chung Chou University of Technology, Changhua, Taiwan, April 21, 2011.
15. Seminar, "Real-time Vision Algorithms for Resource Limited Systems", National Taipei University of Technology (NTUT), Taipei, Taiwan, April 20, 2011.
14. Workshop Speech, "Contour Matching for Fish Species Recognition and Migration Monitoring", NOAA Fisheries Image Processing Workshop, Seattle, WA, September 7-9, 2010.
13. Keynote Speech, "Hardware Implementation of Bio-inspired Vision Algorithms for Its Real-time Applications", Information Technology and Application Workshop, Taipei, Taiwan, June 26, 2009.
12. Seminar, "Compact Embedded Vision Sensor and Its Real-time Applications", National Taipei University (NTPU), Taipei, Taiwan, June 17, 2009.
11. Seminar, "Compact Embedded Vision Sensor and Its Real-time Applications", National Taiwan University of Science and Technology (NTUST), Taipei, Taiwan, June 15, 2009.
10. 2-day short course on high-performance vision computation, National Taipei University of Technology (NTUT), Taipei, Taiwan, June 15-16, 2009.
9. Seminar, "Design of Machine Vision Systems for Real-time Agricultural Applications", Chaoyang University of Technology (CYUT), Taipei, Taiwan, May 2, 2008.
8. Seminar, "Hardware Implementation of Bio-inspired Vision Algorithms for a Compact Embedded Vision Sensor and Its Real-time Applications", National Changhua University of Education, Changhua, Taiwan, May 1, 2008.
7. Seminar, "Vision Aided Flight Stabilization for a Quad-Rotor Micro-UAV", National Taipei University of Technology (NTUT), Taipei, Taiwan, April 30, 2008.
6. Seminar, "Hardware Implementation of Bio-inspired Vision Algorithms for a Compact Embedded Vision Sensor and Its Real-time Applications", National Chung Hsing University (NCHU), Taichung, Taiwan, April 29, 2008.
5. Keynote Speech, "Vision Aided Flight Stabilization for a Quad-Rotor Micro-UAV", 2008 International Conference on Advanced Information Technologies (AIT), Taichung, Taiwan, April 28, 2008.
4. Seminar, "Design and Commercialization of Machine Vision Systems for Agriculture Applications", National Taiwan University (NTU), Department of Bio-Industrial Mechatronics Engineering, Taipei, Taiwan, March 29, 2007.
3. 3-day short course on real-time vision algorithm implementation, National Kaohsiung First University of Science and Technology (NKFUST), Kaohsiung, Taiwan, January 2006.
2. Workshop speaker, "A Semi-Autonomous Unmanned Ground Vehicle Control System," The IEEE 2006 Spring Workshop on Information Theory and Communications, Tainan, Taiwan, January 20-21, 2006.
1. "Machine Vision Monitors Fish Populations," Article appeared in the January 2006 issue of Vision System Design Magazine.

### Inventions

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|---|------------|--------------------|
| 10. Facial Features and Actions Analysis for Concurrent Two-Factor Identity Verification and Applications to be Categorized | 01/08/2021 | Provisional Patent |
| 9. Method and Apparatus for Vision Based Cyclist and Motorcyclist Safety System.  | 02/24/2017 | Provisional Patent |
| 8. Generating Efficient Feature Descriptor Using Synthetic Pattern.   | 06/08/2016 | Provisional Patent |

7.	Real-Time Optical Flow Sensor Design And Its Application To Obstacle Detection	06/07/2016	Patent: 9.361.706
6.	Training an Image Processing Neural Network without Human Selection of Features	04/19/2016	Patent: 9.317.779
5.	Stereo Vision Apparatus and Method	04/19/2016	Patent: 9.317.923
4.	Providing Speech Therapy by Qualifying Pronunciation Accuracy of Speech Signals	05/28/2009	Provisional Patent
3.	Three-dimensional Optical Volume Measurement for Objects to be Categorized	04/19/2002	Patent: 6,369,401
2.	Three-Dimensional Wheel Profile Measurement for Fast Moving Trains	08/11/1998	Patent: 5,793,492
	Developed and filed for Loram Maintenance of Way, Inc.		
1.	Continuous Measurement of Camber, Width and Thickness and Detection of Surface Flaws During Continuous Transport of Thin Foils Using a Non-Contact Technique		
	Developed and filed for General Electric Medical System Group		