

# GavLab Publications

## 1. Books

1. David M. Bevly and Steward Cobb, *GNSS For Vehicle Control*, published by Artech, 2010.

## 2. Article-length Publications

### a. Book Chapters

1. David M. Bevly, Demoz Gebre-Egziabher, Mark Petovello, "Integration of GNSS and INS: Part 1" in *GNSS Applications and Methods*, published by Artech, 2009
2. David M. Bevly, Demoz Gebre-Egziabher, Mark Petovello, "Integration of GNSS and INS: Part 2" in *GNSS Applications and Methods*, published by Artech, 2009
3. Bevly, D. M., Gebre-Egziabher, D., and Parkinson, B. W., "Error Analysis of a Dead Reckoning Navigator for Ground Vehicle Guidance and Control," *selected to be published in the new GPS Red Book*.

### b. Refereed Journal Publications

#### *In Print*

1. Wooten, J. M., Bevly, D.M., Hung, J., "Piezoelectric Polymer-Based Collision Detection Sensor for Robotic Applications," *Electronics*, Vol. 4, No. 1, 2015, pp. 204-220.
2. Brown, Lowell S., Bevly, D.M., "Roll and Bank Estimation Using GPS/INS and Suspension Deflections," *Electronics*, Vol. 4, No. 1, 2015, pp. 118-149.
3. Rose, C.; Britt, J.; Allen, J.; Bevly, D., "An Integrated Vehicle Navigation System Utilizing Lane-Detection and Lateral Position Estimation Systems in Difficult Environments for GPS," *Intelligent Transportation Systems, IEEE Transactions on* , Vol.15, No.6, March, 2014. pp. 2615 – 2629.
4. Ryan, Jonathan, and Bevly, D.M., "On the Observability of Loosely Coupled Global Positioning System/Inertial Navigation System Integrations With Five Degree of Freedom and Four Degree of Freedom Inertial Measurement Units", *Journal of Dynamics, Systems, Measurement, and Control*, Vol. 136, No. 2, March 2014, pp.
5. Martin, S. , Bevly, D.M., " Comparison of GPS-based autonomous vehicle following using global and relative positioning," *International Journal of Autonomous Vehicle Systems*, Vol. 10, No. 3, 2012 pp. 229-255.
6. Miller, J., Bevly, D.M., "A system for autonomous canine guidance," *International Journal of Modelling, Identification and Control*, Vol. 20, No. 1, 2013, pp. 33-46.
7. Dawkins, J.J., Bevly, D.M, and Jackson, R.L., "Evaluation of fractal terrain model for vehicle dynamic simulations," *Journal of Terramechanics*, Vol. 49, No. 6, 2012, pp. 299–307.
8. Miller, J., Bevly D.M., Flowers, G., "A System for Tracking an Autonomously Controlled Canine, *The Journal of Navigation*, Vol. 64, No. 3, July 2012, pp 427-444.
9. Huang, W. and Bevly, D.M. "Set terrain based optimal speed limits for heavy trucks energy saving', *International Journal of. Powertrains*, Vol. 1, No. 4, 2012, pp. 335–350.
10. Dawkins, J.J., Bevly, D.M, and Jackson, R.L. "Fractal Terrain Generation for Vehicle Simulation", *International Journal of Vehicle Autonomous Systems*, Vol. 10, No. 1/2, 2012, pp. 3-18.

11. Huang, W., and D.M. Bevly, "Evaluation of 3D road geometry based heavy truck fuel optimization," *International Journal of Vehicle Autonomous Systems*, Vol. 8, No. 1, pp. 39-55, 2010.
12. Travis, W., Martin, S. Hodo, D.W., Bevly, D.M. "Non Line of Sight Automated Vehicle Following Using a Dynamic Base RTK System." *NAVIGATION, Journal of the Institute of Navigation*, Vol. 58, No. 4, pp. 241-255, 2011.
13. Travis, W., Martin, S., Bevly, D.M. "Automated Short Distance Vehicle Following Using a Dynamic Base RTK System." *International Journal of Vehicle Autonomous Systems*, Vol. 9, No. 1/2, pp. 126-141, 2011.
14. Britt, W., Miller, J., Bevly, D.M., Hamilton, D., and Waggoner, P., "An Embedded System for Real-Time Navigation and Remote Command of a Trained Canine," *Personal and Ubiquitous Computing*, Volume 15, Number 1:61–74, 2011
15. M. Lashley, D. M. Bevly, and J. Y. Hung, "Performance analysis of vector tracking algorithms for weak GPS signals in high dynamics," *IEEE Journal of Selected Topics in Signal Processing*, Vol. 3, No.4, August 2009, pp. 661-673.
16. Derrick, Benton and Bevly, D.M., "Adaptive Steering Control of a Farm Tractor with Varying Yaw Rate Properties", *Journal of Field Robotics*, Vol. 26, No. 6/7, June/July 2009, pp. 519-539.
17. Clanton, J., Bevly, D.M., Hodel, S., "A Low Cost Solution for an Integrated, Multi-Sensor Lane Departure Warning System," *IEEE Transaction on Intelligent Transportation Systems*, Vol. 10, No. 1, pp. 47-59, March 2009.
18. Anderson, R., and Bevly, D. M., "Using GPS with a Model Based Estimator to Estimate Critical Vehicle States," *Journal of Vehicle System Dynamics*, Vol. 48, No. 12, December 2010, pp. 1413-1438.
19. Gartley, E., and Bevly, D.M., "On-line Estimation of Implement Dynamics for Adaptive Steering Control of a Farm Tractor," *IEEE/ASME Transactions on Mechatronics*, Vol. 13, No. 4, August 2008, pp. 429-440.
20. Pearson, P., Bevly, D.M., Raper, R., "Modeling and Validation of Hitch Loading Effects on Tractor Yaw Dynamics," *International Journal of Terramechanics*, Vol. 44, No. 6, December 2007, pp. 439-450.
21. Daily, R., Travis, W., and Bevly, D.M, "Cascaded Estimators to Improve Lateral Vehicle State and Tire Parameter Estimates," *International Journal of Vehicle Autonomous Systems*, Volume 5, Number 3-4, 2007, pp. 230-255.
22. Travis, W. and Bevly, D.M., "Compensation of Vehicle Dynamic Induced Navigation Errors with Dual Antenna GPS Attitude Measurements," *International Journal of Measurement, Identification, and Control*, Vol.8, No. 3, 2008 pp.212-224.
23. Daily, R., Travis, W., Bevly, D.M., et. al., "SciAutonics-Auburn Engineering's Low-Cost, High-Speed ATV for the 2005 DARPA Grand Challenge," *International Journal of Field Robotics*, Vol. 23, No. 8, August 2006, pp. 579-597.
24. Plumlee, J., Hodel, S., and Bevly, D. M., "Control Allocation in Ground Vehicles," *International Journal of Vehicle Design*, Vol. 42, No. 3, 2006, pp. 215-243.
25. Daily, R., Bevly, D. M., "The Use of GPS for Vehicle Stability Control Systems," *IEEE Transactions on Industrial Electronics*, Vol. 51, No. 2, April 2004, pp. 270-277.

*Submitted*

1. Yan Wang, Rajesh Rajamani and David M. Bevly, "Observer Design for Time Invariant and Parameter Varying Differentiable Lipschitz Nonlinear Systems", submitted to *Automatica* on Jan 23rd, 2014;
2. Yan Wang, Rajesh Rajamani and David M. Bevly, "Observer Design for Parameter Varying Differentiable Nonlinear Systems, with Applications to Rigorous Slip Angle Estimation", submitted to *IEEE Transactions on Automatic Control*.

*c. Articles*

1. Lashley, M., and Bevly, D.M., "How do vector delay lock loops predict the satellite signals?," *Inside GNSS*, September/October 2012, pp. 28-34.
2. Britt, J., Bevly, D.M, Rose, C., "A Comparison of Lidar and Camera-Based Lane Detection Systems," *GPS World*, February 2012.
3. Lashley, M., and Bevly, D.M., "What are vector tracking loops and what are their benefits and drawback," *Inside GNSS*, May/June 2009, pp. 16-21.

*d. Conference Publications*

1. Bitner, T., Preston, S., Bevly, D. M. "Multipath and Spoofing Detection Using Angle of Arrival in a Multi-Antenna System," *Proceedings of the 2015 International Technical Meeting of The Institute of Navigation*, Dana Point, California, January 2015.
2. Carson N.R., and Bevly, D. M. "A Robust Method for Spoofing Prevention and Position Recovery in Attacks against Networked GPS Receivers," *Proceedings of the Institute of Navigation International Technical Meeting*, Dana Point, California, January 2015.
3. Pierce, J. D., Bevly, D. M. "A Centralized Approach to Pedestrian Localization Using Multiple Odometry Sources," *Proceedings of the 2015 International Technical Meeting of The Institute of Navigation*, Dana Point, California, January 2015.
4. Preston, S., Bevly, D. M. "CSAC-Aided GPS Multipath Mitigation," *Proceedings of the 46th Annual Precise Time and Time Interval Systems and Applications Meeting*, Boston, Massachusetts, December 2014.
5. Keyser, B., D. Hodo, S. Martin, D. Bevly (2014), Implementation Details of a Real-Time SoC-Based Vector Tracking Receiver, *Proceedings of ION GNSS 2014*.
6. Bishop, R., Bevly, D., Switkes, J., Park, L., "Results of initial tests and evaluation of a Driver-Assistive Truck Platooning prototype," pp. 208-213.
7. Salmon, D. Bevly, D, "An Exploration of Low-Cost Sensor and Vehicle Model Solutions for Ground Vehicle Navigation", *Proceedings of the 2014 IEEE/ION PLANS*, Monterrey, CA.
8. Hennigar, A. Bevly, D, "Error Analysis of GPS Signals From USRP Using GPS Receivers", *Proceedings of the 2014 IEEE/ION PLANS*, Monterrey, CA.
9. Jim Salmon, David M. Bevly, John Y. Hung, "Guidance of a Robotic Off-Road Tractor-Trailer System using Model Predictive Control," *Proceedings of the 2013 ASME DSC Conference*, Stanford, CA, October 2013.
10. Wang, Y., Bevly, D.M., Robust Observer Design for Lipschitz Nonlinear systems with parametric uncertainty. *Proceedings of the 2013 ASME DSC Conference*, Stanford, CA, October 2013.
11. Broshears, E., Martin, S., Bevly, D. 'Ultra-wideband Radio Aided Carrier Phase Ambiguity Resolution in Real-Time Kinematic GPS Relative Positioning.' in *Proceedings of the Institute of Navigation GNSS Conference*. Nashville, TN, 2013

12. Cofield, R., Martin, S., Bevly, D. 'An On-Line Visual Driver Aid for Safe and Precise Convoy Following in Visibility-Impaired Conditions.' in *Proceedings of the Institute of Navigation GNSS Conference*. Nashville, TN, 2013
13. J.H. Britt, D.M. Bevly, "Sensor Auto-Calibration on Dynamic Platforms in 3D", in *Proc. ION GNSS+*, Nashville, TN, 2013.
14. J.H. Britt, D.M. Bevly, "Fully Automated Calibration of Multiple 3D Sensors During Vehicle Maneuvers", in *Proc. ION GNSS+*, Nashville, TN, 2013. (Presentation Only).
15. Wang, Y., Bevly, D.M., "Robust Observer Design for Lipschitz Nonlinear Systems using Quadratic Polynomial Constraints," *2012 IEEE Conference on Decision and Control, December 2012*, Maui, HI, pp. 6621-6626.
16. Wang, Y., Bevly, D.M., Chen, S.-K., "Longitudinal Tire Force Estimation with Unknown Input Observer," *Proceedings of the 2012 Dynamic Systems Control Conference*, Fort Lauderdale, Florida, October 2012, Paper No. 8710. (Selected as best paper of session).
17. Wang, Y., Bevly, D.M., Chen, S.-K., "Lateral Tire Force Estimation with Unknown Input Observer," *Proceedings of the 2012 Dynamic Systems Control Conference*, Fort Lauderdale, Florida, October 2012, Paper No. 8712.
18. Ryan, J., Bevly, D. M., "Tire Radius Determination and Press Loss Detection Using GPS and Vehicle Stability Control Sensors," *Proceedings of the 8th IFAC Symposium on Fault Detection, Supervision, and Safety for Technical Processes*, August 2012.
19. Martin, S.; Rose, C.; Britt, J.; Bevly, D.; Popovic, Z., "Performance analysis of a scalable navigation solution using vehicle safety sensors," *Intelligent Vehicles Symposium (IV), 2012 IEEE* , vol., no., pp.926,931, 3-7 June 2012.
20. Payne, Michael L.; Hung, John Y.; Bevly, David M.; Selfridge, Bob J.; , "Control of a robot-trailer system using a single non-collocated sensor," *Proceedings of IECON 2012 - 38th Annual Conference of the IEEE Industrial Electronics Society*, Montreal, Canada, 25-28 Oct. 2012, pp.2674-2679.
21. Ryan, J., Bevly, D., "Robust Ground Vehicle Constraints for Aiding Stand Alone INS and Determining Inertial Sensor Errors," *Proceedings of the 2012 International Technical Meeting of The Institute of Navigation*, Newport Beach, CA, January 2012.
22. Jordan Britt, D. Broderick, D. Bevly, J. Hung, "Dynamic Testing and Calibration of Gaussian Processes for Vehicle Attitude Estimation," *Proceedings of the Tenth International Conference on Machine Learning Applications / IEEE*, Honolulu, HI, December 2011.
23. Jordan Britt, Christopher Rose, David M. Bevly, "A Comparative Study of Lidar and Camera-based Lane Departure Warning Systems," *Proceedings of the 2011 ION-GNSS Conference*, Portland, OR, Sept. 2011.
24. Lashley, M. Bevly, D.M., "Performance Comparisons of Deep Integration and Tight Coupling," *Proceedings of the 2011 ION-GNSS Conference*, Portland, OR, Sept. 2011.
25. Lashley, M. Bevly, D.M., "Comparison in the Performance of the Vector Delay/Frequency Lock Loop and Equivalent Scalar Tracking Loops in Dense Foliage and Urban Canyon," *Proceedings of the 2011 ION-GNSS Conference*, Portland, OR, Sept. 2011.
26. Broderick, Britt, Ryan, and Bevly, D. M., "Simple Calibration for Vehicle Pose Estimation Using Gaussian Processes," *Proceedings of the 2011 ION ITM Meeting*, San Diego, CA. January, 2011.
27. Allen, J., Bevly, D.M., "Performance Evaluation of Range Information Provided by Dedicated Short Range Communication (DSRC) Radios," *Proceedings of the 2010 ION-GNSS Conference*, Portland, OR, September, 2010.

28. Martin, S., Dawkins, J., Travis, W.E., Bevly, D.M., "Terrain Characterization and Feature Extraction for Automated Convoys," *Proceedings of the 2010 ION-GNSS Conference*, Portland, OR, September, 2010.
29. Broderick, D.J.; Bevly, D.M. & Hung, J.Y., "Modeling Vehicle Lateral Dynamics by Gaussian Processes," *2010 ASME Dynamic Systems and Control Conference*, Boston, MA, September 2010.
30. Britt, W.R.; Lyles, W. L. & Bevly, D.M., "A State Machine Controller for the Autonomous Guidance of a Trained Canine," *2010 ASME Dynamic Systems and Control Conference*, Boston, MA, September 2010.
31. Brown, L.S., Dawkins, J. J. Hill, R.S. and Bevly, D.M., 2010, "Road Bank Estimation on Uneven Terrain for Unmanned Ground Vehicles," *2010 ASME Dynamic Systems and Control Conference*, Boston, MA, September 2010.
32. Ryan, J.; Bevly, D. & Lu, J. State Estimation for Vehicle Stability Control: A Kinematic Approach Using Only GPS and VSC Sensors," *2010 ASME Dynamic Systems and Control Conference*, Boston, MA, September 2010.
33. Allen, J. W. and Bevly, D.M., "Relating Local Vision Measurements to Global Navigation Satellite Systems Using Waypoint Based Maps," *Proceedings of the 2010 IEEE/ION Position, Location and Navigation Symposium (PLANS)*, Palm Springs, CA, May 4-6, 2010.
34. Martin, S., Travis, W., and Bevly, D.M., "Performance Comparison of Single and Dual Frequency Closely Coupled GPS/INS Relative Positioning Systems," *Proceedings of the 2010 IEEE/ION Position, Location and Navigation Symposium (PLANS)*, Palm Springs, CA, May 4-6, 2010.
35. Edwards, L., Clark, B., and Bevly, D.M., "Implementation Details of a Deeply Integrated GPS/INS Software Receiver," *Proceedings of the 2010 IEEE/ION Position, Location and Navigation Symposium (PLANS)*, Palm Springs, CA, May 4-6, 2010.
36. Britt, J., Broderick, D., Bevly, D.M., and Hung, J.W., "LiDAR Attitude Estimation for Vehicle Safety Systems," *Proceedings of the 2010 IEEE/ION Position, Location and Navigation Symposium (PLANS)*, Palm Springs, CA, May 4-6, 2010.
37. Lashley, M. Bevly, D.M., and Hung, J.W., "A Valid Comparison of Vector and Scalar Tracking Loops," *Proceedings of the 2010 IEEE/ION Position, Location and Navigation Symposium (PLANS)*, Palm Springs, CA, May 4-6, 2010.
38. Lashley, M. Bevly, D.M., and Hung, J.W., "Analysis of Deeply Integrated and Tightly Coupled Architectures," *Proceedings of the 2010 IEEE/ION Position, Location and Navigation Symposium (PLANS)*, Palm Springs, CA, May 4-6, 2010.
39. Jordan Hugh Britt, David Bevly, "LiDAR Attitude Estimation for Vehicle Safety Systems," Presented at the SAE World Congress & Exhibition, Intelligent Vehicle Initiative (IVI) Technology Advanced Controls and Navigation Systems, April 2010.
40. Lyles, W.; Britt, W.; Bevly, D.; , "Evolution of Parameters for an Autonomous Canine Control Algorithm," *Machine Learning and Applications*, 2009. ICMLA '09. International Conference on , vol., no., pp.699-704, 13-15 Dec. 2009
41. Nevin, A.B. and Bevly, D.M. "Landmark Extraction Using Corner Detection and K-means Clustering for Autonomous Leader-Follower Caravan," *Proceedings of the 12th IASTED International Conference Intelligent Systems and Control. (ISC 2009)*. pp 88-92.
42. Dawkins, J.J., Bevly, D.M., and Jackson, R.L. (2009), "Multiscale Terrain Characterization Using Fourier and Wavelet Transforms for Unmanned Ground Vehicles" *Proceedings of the 2009 ASME Dynamic Systems and Controls Conference*.

43. Ryan, J.; Bevly, D. & Lu, J., "Robust sideslip estimation using GPS road grade sensing to replace a pitch rate sensor," 2009 IEEE International Conference on Systems, Man, and Cybernetics, 2009, pp 2026 -2031.
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46. Luke Edwards, Matthew Lashley, and David Bevly, "FPGA Implementation of a Vector Tracking GPS Receiver using Model-Based Tools," Proceedings of the 2009 ION GNSS, Savannah, GA, September, 2009.
47. Benjamin J Clark and David M Bevly, "FDE Implementations for a Low-Cost GPS/INS Module," Proceedings of the 2009 ION GNSS, Savannah, GA, September, 2009.
48. J. Allen, J. Britt, C. Rose, and D. Bevly, "Intelligent Multi-Sensor Measurements to Enhance Vehicle Navigation and Safety Systems," Proceedings of the 2009 International Technical Meeting, Anaheim, California.
49. Rose, C., Allen, J., and Bevly, D. M., "Vehicle Lane Position Estimation with Camera Vision using Bounded Polynomial Interpolated Lines," Proceedings of the 2009 International Technical Meeting, Anaheim, California.
50. Jordan Britt and David M. Bevly, "Lane Tracking using Multilayer Laser Scanner to Enhance Vehicle Navigation and Safety Systems," presented at The Institute of Navigation 2009 International Technical Meeting, Anaheim, California, 2009.
51. Travis, W., Bevly, D.M. "Performance Analysis of a Closely Coupled GPS/INS Relative Positioning Architecture for Automated Ground Vehicle Convoys," Proceedings of the 2009 International Technical Meeting of the Institute of Navigation, Anaheim, CA.
52. M. Lashley and D. M. Bevly, "Vector delay/frequency lock loop implementation and analysis," in Proceedings of the 2009 International Technical Meeting of the Institute of Navigation. Anaheim, California: Institute of Navigation, January 2009.
53. Miller, J., and Bevly, D.M. "Guided K-9 Tracking Improvements Using GPS, INS, and Magnetometers," Proceedings of the 2009 ION ITM Conference, Anaheim, CA, January, 2009.
54. Nevin, A. B, Hodel, A.S., and Bevly, D. M. "Object Registration Through Statistics and Hough Transform," Proceedings of the 2008 IASTED Intelligent Systems and Control Conference, Orlando, FL, Nov, 2008
55. M. Lashley and D. M. Bevly, "Comparison of traditional tracking loops and vector based tracking loops for weak GPS signals," Proceedings of the 2008 National Technical Meeting of the Institute of Navigation. San Diego, California: Institute of Navigation, January 2008.
56. M. Lashley and D. Bevly, "A comparison of the performance of a non-coherent deeply integrated navigation algorithm and a tightly coupled navigation algorithm," in Proceedings of the 21st International Technical Meeting of the Satellite Division of the Institute of Navigation. Savannah, GA: Institute of Navigation, September 2008.
57. Lashley, M. and Bevly, D.M. "Comparison of Adaptive Estimation Techniques for GPS Vector Tracking," Proceedings of the 2008 AIAA Guidance, Navigation, and Control Conference, Honolulu, HI, August, 2008

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59. Lashley, M., Bevly, D. M., and Hung, J. "Impact of Carrier Power to Noise Power Density Ratio, Platform Dynamics, and IMU Quality on Deeply Integrated Navigation," Proceedings of the 2008 PLANS Conference, Monterey, CA, May, 2008
60. Travis, W.E., and Bevly, D.M, "Trajectory Duplication with a Relative Position Measurement for Ground Vehicle Convoys," Proceedings of the 2008 PLANS Conference, Monterey, CA, May, 2008.
61. Daily, R., and Bevly, D.M., Harmonic Potential Field Path Planning for high Speed Vehicles, Proceedings of the 2008 American control Conference, Seattle, Washington, June, 2008.
62. Britt, W., Bevly, D.M., and Dozier, G. V. "Automated Modeling of the Guidance of a K-9," Proceedings of the American Controls Conference, June 2008.
63. Derrick, J.B., Bevly, D.M., and Rekow, A.K., "Model-Reference Adaptive Steering Control of a Farm Tractor with Varying Hitch Forces," Proceedings of the 2008 American Controls Conference, Seattle, WA, June 2008.
64. Derrick, J.B., and Bevly, D.M., "Adaptive Control of a Farm Tractor with Varying Yaw Dynamics Accounting for Actuator Dynamics and Saturations," Proceedings of the 2008 Conference on Control Applications, San Antonio, TX, September 2008.
65. Clark, B.J, and Bevly, D.M, "GPS/INS Integration with Fault Detection and Exclusion in Shadowed Environments," Proceedings of the 2008 PLANS Conference, Monterey, CA, May, 2008
66. Henderson, H.P., and Bevly, D.M. "Relative Position of UGVs in Constrained Environments using Low Cost IMU and GPS Augmented with Ultrasonic Sensors," Proceedings of the 2008 PLANS Conference, Monterey, CA, May, 2008.
67. M. Lashley and D. M. Bevly, "Comparison of traditional tracking loops and vector based tracking loops for weak GPS signals," in *Proceedings 2007 ION GNSS and Proceedings of the 2008 ION NTM*
68. Miller, J., and Bevly, D.M., "Position and Orientation Determination for a Guided K-9," Proceedings of the 2007 ION-GNSS Conference, Ft. Worth, TX, September, 2007
69. Huang, W., Bevly, D.M., Li, X., Schnick, S., "3D Road Geometry Based Optimal Truck Fuel Economy," Proceedings of 2007 IMECE, Paper No. 41695, November, 2007.
70. Edwards, D. and Bevly, D.M., "A Method to Estimate Critical Tire Properties Using Non-Linear Tire Models," Proceedings of IMECE 2007, Paper No. 42064, November 2007.
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72. Lambert, K., and Bevly, D.M. "Enhanced Stability Controllers for UGVs," Proceedings of AUVSI's Unmanned Systems North America 2007, August 2007.
73. Lambert, Kenneth and Bevly, David M. "Weight Split's Effect on Vehicle Rollover Propensity and ESC Effectiveness," Proceedings of the Fifth IFAC Symposium on Advances in Automotive Control, August 2007.
74. Pearson, P., Bevly, D.M., Raper, R., "Modeling and Validation of Hitch Loading Effects on Tractor Yaw Dynamics," Proceedings of the ISTVS Conference, Fairbanks, Alaska, June 23-26, 2007.
75. Lashley and D. Bevly, "Analysis of Discriminator Based Vector Tracking Algorithms," in Institute of Navigation National Technical Meeting, 2007

76. D. Hodo, J.Y. Hung, D.M. Bevly, S. Millhouse. "Linear Analysis of Trailer Lateral Error with Sensor Noise for a Mobile Robot-Trailer System." To be published in the Proceedings of the 2007 International Symposium on Industrial Electronics. Vigo, Spain.
77. D. Hodo, J.Y. Hung, D.M. Bevly, S. Millhouse. "Effects of sensor placement and errors on path following control of a mobile robot-trailer system." To be published in Proceedings of the 26th American Controls Conference. 2007, New York, NY
78. B.J. Clark, D.M. Bevly, S. Farritor, Analysis of Improvement to Two-Wheel Robot Navigation Using Low-Cost GPS/INS Aids, Proceedings of the ION GNSS, Fort Worth, TX, Sept. 26-29, 2006.
79. Clanton, J., Bevly, D. M., Hodel, S., "Highway Lane Tracking Using GPS in Conjunction With Onboard IMU and Vision-based Lane Tracking Measurements," Proceedings of the ION GNSS, Fort Worth, TX, Sept. 26-29, 2006.
80. Wall, J. and Bevly, D. M., "Characterization of Inertial Sensor Measurements for Navigation Performance Analysis," Proceedings of the Institute of Navigation GNSS Conference, Fort Worth, TX, September 2006.
81. Bevly, D.M., Daily, R., and Travis, W., "Estimation of Critical Tire Parameters Using GPS Based Sideslip Measurements," Proceedings of the 2006 SAE Automotive Dynamics Stability and Controls Conference and Exhibition, P-395, SAE Paper No. 2006-1-1965, Novi, MI, February, 2006, pp. 87-94.
82. Whitehead, R. J., Bevly, D. M., and Clark, B., "ESC Effectiveness During Property Variations on Scaled Vehicles," *Proceedings of the 2005 ASME IMECE*, Orlando, FL, November 5-11, 2005.
83. Heffernan, M. E., Bevly, D. M., "Validation of Longitudinal Vehicle Estimation Techniques on a Heavy Truck Test Bed," *Proceedings of the 2005 ASME IMECE*, Orlando, FL, November 5-11, 2005.
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85. Pearson, P., Bevly, D.M., "Comparison of Analytical and Empirical Models to Capture Variations in Off-Road Vehicle Dynamics," *Proceedings of the 2005 ASME IMECE*, Orlando, FL, November 5-11, 2005.
86. Travis, W., Bevly, D.M., "Navigation Errors Introduced By Ground Vehicle Dynamics," *Proceedings of the 2005 ION GNSS*, Long Beach, CA, September 13-16, 2005.
87. Hamm, C., Bevly, D.M., "Simulated Performance Analysis of a Composite Vector Tracking and Navigation Filter," *Proceedings of the 2005 ION GNSS*, Long Beach, CA, September 13-16, 2005.
88. Flenniken, W., Wall, J., Bevly, D.M., "Characterization of Various IMU Error Sources and the Effect on Navigation Performance," *Proceedings of the 2005 ION GNSS*, Long Beach, CA, September 13-16, 2005.
89. Behringer, R., Travis, W., Daily, R., Bevly, D.M., Kubinger, W., Herzner, W., Fehlberg, V., "RASCAL - An Autonomous Ground Vehicle for Desert Driving in the DARPA Grand Challenge 2005," *Proceedings of the 2005 ITSC*.
90. Travis, W., Simmons, A., Bevly, D.M., "Corridor Navigation with a Lidar-INS Kalman Filter Solution," *Proceedings of the 2005 IEEE Intelligent Vehicles Conference*, Las Vegas, NV, June 6-8, 2005, pp. 343-348.
91. Anderson, R., Bevly, D.M., "Estimation of Tire Cornering Stiffness Using GPS to Improve Model Based Estimation of Vehicle States," *Proceedings of the 2005 IEEE Intelligent Vehicles Conference*, Las Vegas, NV, June 6-8, 2005, pp. 801-806.



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93. Anderson, R., Bevly, D.M., “Estimation of Vehicle Slip Angle using GPS/INS Measurements with a Model Based Estimator,” *Proceedings of the 2004 American Control Conference*, Boston, MA, June 2004, pp. 2122 – 2127.
94. Plumlee, J., Bevly, D.M., and Hodel, S., “Control of a Ground Vehicle using Quadratic Programming Based Control Allocation,” *Proceedings of the 2004 American Control Conference*, Boston, MA, June 2004, pp. 4704 – 4709.
95. Travis, Whitehead, Bevly, and Flowers, “Using Scaled Vehicles to Investigate the Influence of Various Properties on Rollover Propensity,” *Proceedings of the 2004 American Control Conference*, Boston, MA, June 2004, pp. 3381-3386.
96. Whitehead, Travis, Bevly, and Flowers, “A Study of the Effect of Various Vehicle Parameters on Rollover Propensity,” *Proceedings of the 2004 SAE Automotive Dynamics Stability & Controls Conference*, SAE Paper No. 2004-01-2094, Detroit, MI, May 2004.
97. R. Behringer, B. Gregory, V. Sundareswaran, B. Addison, R. Elsley, W.Guthmiller, J. deMarchi, R. Daily, D. Bevly, C. Reinhart. Development of an Autonomous Road Vehicle for the DARPA Grand Challenge. IFAC Symposium on Intelligent Autonomous Vehicles 2004, Lisbon, July 5-7, 2004.
98. Behringer, V. Sundareswaran, B. Gregory, R. Elsley, B. Addison, W. Guthmiller, R. Daily, D. Bevly. The DARPA Grand Challenge “Development of an Autonomous Vehicle. IEEE Symposium on Intelligent Vehicles 2004, Parma, June 14-17, 2004.

#### 4. Thesis/Dissertations

Student	Title	Dept.	MS/PhD	Year
Robert Daily	Model-free Control of Unmanned Ground Vehicles	ME	PhD	2008
Winnard Britt	A software and hardware system for the autonomous control and navigation of a trained canine	CS	PhD	2009
Matthew Lashley	Modeling and Performance Analysis of GPS Vector Tracking Algorithms	EE	PhD	2009
William Travis	Navigation Accuracy of Various Sensors for Ground Vehicles	ME	PhD	2010
Wei Huang	On-line Vehicle Estimation and Navigation	ME	PhD	2010
Jeffrey Miller	A Maximum Effort Control System for the Tracking and Control of a Guided Canine	ME	PhD	2010
David Broderick	Dynamic Gaussian Process Models for Model Predictive Control of Vehicle Roll	EE	PhD	2012
Ben Clark	Fault Detection and Exclusion in Deeply Integrated GPS/INS	ME	PhD	2012
Jeremy Dawkins	Terrain and Road Characterization and Roughness Estimation for Simulation and Control of Unmanned Ground Vehicles	ME	PhD	2011
Yan Wang	Integrated sensor fusion for vehicle control applications	ME	PhD	2014
Paul Pearson	Modeling the Variations of Tractor Dynamics for Typical Farm Applications	ME	MS	2007

William Travis	Navigation Accuracy of Various Sensors for Ground Vehicles	ME	MS	2006
John Wall	Navigation in GPS Denied Areas	ME	MS	2007
Kenny Lambert	Anti-roll Control of Tele-operated UGVs	ME	MS	2007
Dustin Edwards	Mobility Models for FCS UGVs	ME	MS	2008
Matt Lashley	Development and Analysis of Deeply Integrated GPS/INS	EE	MS	2006
Michael Newlin	Development of a Software GPS Receiver	EE	MS	2006
Josh Clanton	GPS Applications for Advanced Driver Assistance Systems	EE	MS	2006
Benton Derrick	Direct Adaptive Control of Farm Tractors	ME	MS	2008
Rusty Anderson	Using GPS for Model Based Estimation of Critical Vehicle States and Parameters	ME	MS	2004
John Plumlee	Novel Control Allocation and Quadratic Programming Algorithms for Control of Aero and Ground Vehicles	ME	MS	2004
Christopher Hamm	Comparison of GPS/INS Integration Techniques for High Dynamic Environments	EE	MS	2005
Evan Gartley	Adaptive Steering Control of Farm Tractors	ME	MS	2005
Randy Whitehead	Determination of Vehicle Parameters that Influence Vehicle Rollover Propensity	ME	MS	2005
Warren Flenniken	Low-level GPS/INS Sensor Fusion for Improved Vehicle Navigation	ME	MS	2005
David Hodo	Development of an autonomous mobile robot-trailer system for UXO detection	EE	MS	2007
Harold Henderson	Relative positioning of unmanned ground vehicles using ultrasonic sensors	ME	MS	2008
Andrew Nevin	Registration and tracking of objects with computer vision for autonomous vehicles	EE	MS	2009
Kenneth Lambert	A study of vehicle properties that influence rollover and their effect on electronics stability controllers	ME	MS	2007
Dustin Edwards	Parameter estimation techniques for determining safe vehicle speeds in UGVs	ME	MS	2008
Ben Clark	GPS/INS Operation in Shadowed Environments	ME	MS	2008
Ryan Hill	Tire Force Estimation in Off-Road Vehicles using Suspension Strain and Deflection Measurements	ME	MS	2012
Lowell Brown	Roll & Bank Estimation Using GPS/INS and Suspension Deflections	ME	MS	2012
Scott Martin	Closely Coupled GPS/INS Relative Positioning for Automated Vehicle Convoys	ME	MS	2011
Jonathan Ryan	A Fully Integrated Sensor Fusion Method Combining a Single Antenna GPS Unit with Electronic Stability Control Sensors	ME	MS	2011
Chris Rose	Robust lane detection using Vision/IMU measurements	EE	MS	2010
Jordan Britt	Lane detection and vehicle attitude using Lidar	EE	MS	2010
John Allen	Use of Vision Sensors and Lane Maps to Aid GPS-INS Navigation	ME	MS	2011

William Woodall	Low-Bandwidth Three Dimensional Mapping and Latency Reducing Model Prediction to Improve Teleoperation of Robotic Vehicles	CS	MS	2012
Mike Payne	Non-Collocated Control of an Autonomous Vehicle-Trailer System Using State Estimation	EE	MS	2012
Michael Wooten	High-Dynamic Range Collision Detection using Piezoelectric Polymer Films for Planar and Non-planar Applications	EE	MS	2013
Robert Williams	Evaluation of Beam Load Cell Use for Base Reaction Force Collision Detection on Industrial Robots	ME	MS	2014
James Salmon	Guidance of an Off-Road Tractor-Trailer System Using Model Predictive Control	ME	MS	2013
Thomas Bitner	Detection and Removal of Erroneous GPS Signals Using Angle of Arrival	ME	MS	2013
Eric Broshears	Ultra-wideband Radio Aided Carrier Phase Ambiguity Resolution in Real-Time Kinematic GPS Relative Positioning	ME	MS	2013
Jameson Colbert	Development of a Custom Data Acquisition System for the Study of Vehicle Dynamics in Longer Combination Vehicles	ME	MS	2014
Andrew Hennigar	Analysis of Record and Playback Errors of GPS Signals Caused by the USRP	ME	MS	2014