RESUME

Adam Hoover

PERSONAL DATA

Professor
Electrical and Computer Engineering Department
Clemson University
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EDUCATION

Post-Doc., University of California, San Diego, 1996-1998, Electrical and Computer Engineering
Ph.D., University of South Florida, 1996, Computer Science and Engineering
M.S., University of South Florida, 1993, Computer Engineering
B.S., University of South Florida, 1992, Computer Engineering

PROFESSIONAL EXPERIENCE

Clemson University, 20015-, Professor of Electrical and Computer Engineering
Clemson University, 2004-2015, Associate Professor of Electrical and Computer Engineering
Clemson University, 1999-2004, Assistant Professor of Electrical and Computer Engineering
University of California, San Diego, 1996-1998, Assistant Project Scientist
University of California, San Diego, 1998, Visiting Lecturer
University of South Florida, 1996, Visiting Lecturer
University of South Florida, 1992-1996, Graduate Research Assistant
Oak Ridge National Laboratories, 1993, 1994, Visiting Research Assistant

MEMBERSHIPS

Senior Member, Institute of Electrical and Electronics Engineers, IEEE, 2006-
Member, Institute of Electrical and Electronics Engineers, IEEE, 1993-2006
Member, The Obesity Society, 2011-; founding member of section on eHealth/mHealth
Member, American Medical Informatics Association, AMIA, 1998
Member, Association for Research in Vision & Ophthalmology, ARVO, 1997-8, 2000-1

PUBLICATIONS

Books and Monographs

A. Hoover, R. Mattfeld and E. Muth, "Bites as a Unit of Measurement", chapter 8 in eds. Dale A. Schoeller M. Westerterp, *Advances in the Assessment of Dietary Intake*, CRC Press, August 2017, pp. 149-161.

E. Muth and A. Hoover, "Designing Mobile Health Technologies for Self-Monitoring: The Bite Counter as a Case Study", in Rehg, James M., Susan Murphy, and Santosh Kumar, eds. *Mobile Health: Sensors, Analytic Methods, and Applications*. Springer, 2017, pp. 101-120.

A. Hoover, *System Programming with C and Unix*, Addison-Wesley, 2009, ISBN 978-0136067122.

A. Hoover and E. Muth, "Instrumenting for measuring ", in *The PSI Handbook of Virtual Environments for Training and Education, Volume 3:Integrated Systems, Training Evaluations and Future Directions*, edited by D. Schmorrow, J. Cohn and D. Nicholson, Praeger Security International Publishing, Westport CT, 2008, pp. 184-195.

E. Muth, A. Kruse, A. Hoover and D. Schmorrow, "'Augmented Cognition: Aiding the Soldier in High and Low Workload Environments through Closed-Loop Human-Machine

Interactions", in *Military Life: The Psychology of Serving in Peace and Combat*, edited by T. Britt, C. Castro and A. Adler, Praeger Security Int'l Publishing, 2006, pp. 108-127.

A. Hoover, D. Goldgof, L. Stark and K. W. Bowyer, "Function-Based Analysis using Partial Shape", Chapter VIII in *Generic Object Recognition Using Form and Function*, by L. Stark and K. W. Bowyer, 1996 World Scientific Publishing, pp 67-79.

O. H. Dorum, A. Hoover and J. P. Jones, "Calibration and control issues in range imaging for mobile robot navigation", in *Research in Computer and Robot Vision*, edited by C. Archibald and P. Kwok, 1995 World Scientific Press, pp 1-18.

Refereed Journal Publications (49 total, authorship by my students denoted using *)

R. Mattfeld*, E. Jesch and A. Hoover, "Evaluating Pedometer Algorithms on Semi-Regular and Unstructured Gaits", in Sensors, vol. 21 no. 13, June 2021, doi: 10.3390/s21134260

S. Goldstein, A. Hoover, E.W. Evans and J.G. Thomas, "Combining ecological momentary assessment, wrist-based eating detection, and dietary assessment to characterize dietary lapse: A multi-method study protocol", in Digital Health, vol. 7, pp. 1-16, 2021, doi: 10.1177/2055207620988212

C. Goldstein, S. Goldstein, D. Thomas, A. Hoover, D. Bond, G. Thomas, "The Behavioral Intervention with Technology for E-weight loss Study (BITES): Incorporating energy balance models and the Bite Counter into an online behavioral weight loss program", in *Journal of Technology in Behavioral Science*, vol. 6 no. 2, pp. 406-418, 2021.

G. Turner-McGrievy, et. al., "The role of self-efficacy and information processing in weight loss during an mHealth behavioral intervention", in *Digital Health*, Nov 2020, doi: 10.1177/2055207620976755

S. Sharma*, Jasper, P., Muth, E., & Hoover, A., "The impact of walking and resting on wrist motion for automated detection of meals", in *ACM Transactions on Computing for Healthcare*, 1(4), pp. 1-19, 2020.

M. Wilson, S. Beadle, A. Kinsella, R Mattfeld*, A. Hoover and E. Muth, "Task Performance in a Head-Mounted Display: The Impacts of Varying Latency", in *Displays*, vol. 61, Jan 2020.

G. Turner-McGrievy, C. Dunn, S. Wilcox, A. Boutté, B. Hutto, A. Hoover and E. Muth, ``Defining Adherence to Mobile Dietary Self- Monitoring and Assessing Tracking Over Time: Tracking at Least Two Eating Occasions per Day Is Best Marker of Adherence within Two Different Mobile Health Randomized Weight Loss Interventions", in J. of the Academy of Nutrition and Dietetics, May 2019.

J. Salley, A. Hoover and E. Muth, "Between- and Within-Subjects Predictors of the Kilocalorie Content of Bites of Food", in *Journal of the Academy of Nutrition and Dietetics*, vol. 119 no. 7, July 2019, pp. 1109-1117.

A. Boutté, G. Turner-McGrievy, S. Wilcox, B. Hutto, E. Muth and A. Hoover, "Comparing changes in diet quality between two technology-based diet tracking devices", in *Journal of Technology in Behavioral Science*, vol. 4 no. 1, 2019, pp. 25-32.

Alex J, Turner D, Thomas DM, McDougall A, Halawani MW, Heymsfield SB, Martin CK, Scisco JL, Salley J, Muth E, Hoover AW. "Bite count rates in free-living individuals: new insights from a portable sensor", in *BMC Nutrition*. 2018 May;4(1):23.

G. Turner-McGrievy, S. Wilcox, A. Boutté, B. Hutto, C. Singletary, E. Muth and A. Hoover, "The Dietary Intervention to Enhance Tracking with mobile (DIET Mobile) study: A six-month randomized weight loss trial", in *Obesity*, 25.8 (2017): 1336-1342.

G. Turner-McGrievy, A. Boutté, A. Crimarco, S. Wilcox, B. Hutto, A. Hoover and E. Muth, "Byte by Bite: Use of a mobile Bite Counter and weekly behavioral challenges to promote weight loss", in *Smart Health*, 3 (2017): 20-26.

R. Mattfeld*, E. Muth and A. Hoover, "Measuring the consumption of individual solid and liquid bites using a table embedded scale during unrestricted eating", in *IEEE Journal of Biomedical and Health Informatics*, vol. 21 no. 6, Nov 2017, pp. 1711-1718.

Y. Shen*, J. Salley, E. Muth and A. Hoover, "Assessing the Accuracy of a Wrist Motion Tracking Method for Counting Bites across Demographic and Food Variables", in *IEEE Journal of Biomedical and Health Informatics*, vol. 21 no. 3, March 2017, pp. 599-606.

G. Turner-McGrievy, S. Wilcox, A. Kaczynski, D. Spruijt-Metz, B. Hutto, E. Muth and A. Hoover, "Crowdsourcing for self-monitoring: Using the Traffic Light Diet and crowdsourcing to provide dietary feedback", in *Digital Health*, vol. 2, July 2016, pp. 1-7.

P. Jasper, M. James, A. Hoover and E. Muth, "Effects of Bite Count Feedback from a Wearable Device and Goal-Setting on Consumption in Young Adults", in *Journal of the Academy of Nutrition and Dietetics*, vol. 116 no. 11, 2016, pp. 1785-1793.

A. Kinsella, R. Mattfeld*, E. Muth and A. Hoover, "Frequency, not amplitude, of latency affects subjective sickness in a Head-Mounted Display", in *Aerospace Medicine and Human Performance*, vol. 87 no. 7, July 2016, pp. 604-609.

J. Salley, E. Muth, M. Wilson and A. Hoover, "A Comparison Between Human and Bite-Based Methods of Estimating Caloric Intake", in *Journal of the Academy of Nutrition and Dietetics*, vol. 116 no. 10, Oct 2016, pp. 1568-1577.

M. St Pierre, S. Banerjee*, A. Hoover and E. Muth, "The Effects of 0.2 Hz Varying Latency with 20-100 ms Varying Amplitude on Simulator Sickness in a Helmet Mounted Display", in *Displays*, vol. 36, Jan 2015, pp. 1-8.

R. Ramos*, E. Muth, J. Gowdy and A. Hoover, "Improving the Recognition of Eating Gestures Using Inter-Gesture Sequential Dependencies", in *IEEE Journal of Biomedical and Health Informatics*, vol. 19 no. 3, May 2015, pp. 825 – 831.

Y. Dong*, J. Scisco, M. Wilson, E. Muth and A. Hoover, "Detecting Periods of Eating During Free Living by Tracking Wrist Motion", in *IEEE Journal of Biomedical and Health Informatics*, vol. 18 no. 4, July 2014, pp. 1253-1260.

J. Scisco, E. Muth and A. Hoover, "Examining the Utility of a Bite-Count Based Measure of Eating Activity in Free-Living Humans", in *Journal of the Academy of Nutrition and Dietetics*, vol. 114 no. 3, April 2014, pp. 464-469.

S. Banerjee*, W. Suski* and A. Hoover, "Identifying and Filtering Noise Caused by Sensor Set Switching in UWB Indoor Position Tracking", in *International Journal of Ultrawideband Communications and Systems*, Jan. 2014, vol. 3 no. 1, pp. 8-18.

W. Suski*, S. Banerjee* and A. Hoover, “Using a Map of Measurement Noise to Improve UWB Indoor Position Tracking”, in *IEEE Trans. on Instrumentation and Measurement*, 2013, vol. 62 no. 8, Aug 2013, pp. 2228-2236.

W. Wu*, Y. Dong* and A. Hoover, “Measuring Digital System Latency from Sensing to Actuation at Continuous 1 ms Resolution”, in *Presence: Teleoperators and Virtual Environments*, vol. 22, no. 1, 2013, pp. 20-35.

A. Hoover, A. Singh*, S. Fishel-Brown and E. Muth, “Real-time detection of workload changes using heart rate variability”, in *Biomedical Signal Processing and Control*, vol. 7 no. 4, 2012, pp. 333-341.

T. Epton* and A. Hoover, “Improving Odometry using a Controlled Point Laser”, in *Autonomous Robots*, vol. 32, 2012, pp. 165-172.

Y. Dong*, A. Hoover, J. Scisco and E. Muth, “A New Method for Measuring Meal Intake in Humans via Automated Wrist Motion Tracking”, in *Applied Psychophysiology and Biofeedback*, vol. 37, no. 3, 2012, pp. 205-215.

J. Scisco, E. Muth, Y. Dong* and A. Hoover, “Slowing bite-rate reduces caloric consumption; an application of the bite counter device”, *Journal of the American Dietetic Association*, vol. 111, August 2011, pp. 1231-1235.

A. Walker, E. Muth, F. Switzer and A. Hoover, “The role of head movements in simulator sickness generated by a virtual environment”, *Aviation, Space and Environmental Medicine*, vol 81, Oct 2010, pp. 929-934.

A. Elkins, E. Muth, A. Hoover, A. Walker, T. Carpenter and F. Switzer, “Physiological Compliance and Team Performance”, *Applied Ergonomics*, vol. 40, 2009, pp. 997-1003.

J. Rand*, A. Hoover, S. Fishel, J. Moss, J. Pappas and E. Muth, ``Real-Time Correcton of Heart Interbeat Intervals’’, *IEEE Trans. on Biomedical Engineering*, vol. 54, 2007, pp. 946-950.

S. Fishel, E. Muth, and A. Hoover, “Establishing appropriate physiological baseline procedures for real-time physiological measurement”, *Journal of Cognitive Engineering and Decision Making*, vol. 1 no. 3, 2007, pp. 286-308.

I. Walker, A. Hoover and Y. Liu*, “Handling unpredicted motion in industrial robot workcells using sensor networks”, in *Industrial Robot*, vol. 33 no. 1, 2006, pp. 56-59.

Y. Liu*, A. Hoover and I. Walker, “Handling uncertainty due to the delay between complex sensing and manipulation in an industrial workcell”, *Robotica*, vol. 24, no. 6, pp. 697-698, Nov. 2006.

A. Hoover and E. Muth, "A Real-Time Index of Vagal Activity", *International Journal of Human-Computer Interaction*, vol. 17, no. 2, 2004, pp. 197-209.

Y. Liu*, A. Hoover and I. Walker, “A Timing Model for Vision-Based Control of Industrial Robot Manipulators”, *IEEE Transaction on Robotics*, Vol. 20, No. 5, pp. 891-898, Oct. 2004.

A. Hoover and M. Goldbaum, "Locating the Optic Nerve in a Retinal Image Using the Fuzzy Convergence of the Blood Vessels", *IEEE Transactions on Medical Imaging*, vol. 22, no. 8, August 2003, pp. 951-958.

A. Hoover, D. Goldgof and K. Bowyer, "Egomotion Estimation of a Range Camera Using the Space Envelope", *IEEE Transactions on Systems, Man & Cybernetics, Part B*, vol. 33, no. 4, August 2003, pp. 717-721.

A. Hoover, "Computer Vision in Undergraduate Education: Modern Embedded Computing", *IEEE Transactions on Education*, vol. 46, no. 2, May 2003, pp. 235-240.

P. Flynn, A. Hoover and J. Phillips, "Guest Editorial: Special Issue on Empirical Evaluation of Computer Vision Algorithms", in *Computer Vision and Image Understanding*, vol. 84, no. 1, October 2001, pp. 1-4.

B. Olsen* and A. Hoover, "Calibrating a Camera Network Using a Domino Grid", *Pattern Recognition*, vol. 34 no. 5, May 2001, pp. 1105-1117.

A. Hoover, V. Kouznetsova and M. Goldbaum, "Locating Blood Vessels in Retinal Images by Piece-wise Threshold Probing of a Matched Filter Response", *IEEE Transactions on Medical Imaging*, vol. 19 no. 3, March 2000, pp. 203-210.

D. Granet, A. Hoover, A. Smith, S. Brown, D.-U. Bartsch and B. Brody, "New Objective Digital Computerized Vision Screening System", in *Journal of Pediatric Ophthalmology and Strabismus*, vol. 36 no. 5, Sept/Oct 1999, pp. 251-256.

A. Hoover, D. B. Goldgof and K. W. Bowyer, "Dynamic-Scale Model Construction from Range Imagery", *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 20 no. 12, Dec 1998, pp 1352-1357.

A. Hoover, D. B. Goldgof and K. W. Bowyer, "The Space Envelope: A Representation for 3D Scenes", *Computer Vision and Image Understanding*, vol. 69, no. 3, March 1998, pp 310-329.

L. Stark, K. W. Bowyer, A. Hoover and D. B. Goldgof, "Recognizing Object Function Through Reasoning About Partial Shape Descriptions and Dynamic Physical Properties", *Proceedings of the IEEE*, vol. 84 no. 11, Nov 1996, pp 1640-1656.

A. Hoover, G. Jean-Baptiste, X. Jiang, P. J. Flynn, H. Bunke, D. Goldgof, K. Bowyer, D. Eggert, A. Fitzgibbon and R. Fisher, "An Experimental Comparison of Range Image Segmentation Algorithms", *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 18 no. 7, July 1996, pp. 673-689.

A. Hoover, D. Goldgof and K. Bowyer, "Extracting a Valid Boundary Representation from a Segmented Range Image", *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 17 no. 9, Sept 1995, pp 920-924.

Conference Proceedings (Reviewed) (48 total)

S. Sharma and A. Hoover, "The Challenge of Metrics in Automated Dietary Monitoring as Analysis Transitions from Small Data to Big Data", in the proc. of IEEE Int'l Conf on Bioinformatics and Biomedicine, Dec. 2020.

Y. Luktuke and A. Hoover, "Segmentation and Recognition of Eating Gestures from Wrist Motion using Deep Learning", in the proc. of IEEE Big Data, Dec. 2020.

S. Sharma and A. Hoover, “A Study on Linear Acceleration of the Wrist During Free-living”, in the proc. of IEEE Int’l Conf on Bioinformatics and Biomedicine, Nov. 2019.

B. Lin and A. Hoover, ``A Comparison of Finger and Wrist Motion Tracking to Detect Bites during Food Consumption'', in the proc. of IEEE Int’l Conf on Body Sensor Networks, May 2019.

R. Mattfeld, E. Jesch and A. Hoover, ``Evaluation of a Commercial Pedometer on Multiple Gait Types Using Video for Ground Truth'', in the proc. of IEEE Int’l Conf on Biomedical and Health Informatics, May 2018.

S. Sharma, P. Jasper, E. Muth and A. Hoover, `` An Evaluation of a Wrist Motion Tracking Algorithm to Detect Eating Activities on 408 People'', in the proc. of IEEE Int’l Conf on Biomedical and Health Informatics, May 2018.

R. Mattfeld, E. Jesch and A. Hoover, ``A new dataset for evaluating pedometer performance'', in the proc. of IEEE International Conference on Bioinformatics and Biomedicine, pp. 865-869, Nov 2017.

Y. Shen, E. Muth, and A. Hoover, "Recognizing Eating Gestures Using Context Dependent Hidden Markov Models", in the proc. of IEEE Conference on Connected Health: Applications, Systems and Engineering Technologies, June 2016, pp. 248-253.

S. Sharma, P. Jasper, E. Muth, and A. Hoover, "Automatic Detection of Periods of Eating using Wrist Motion Tracking", in the proc. of IEEE Conference on Connected Health: Applications, Systems and Engineering Technologies, June 2016, pp. 362-363.

J. Lucas, J. Burgett, A. Hoover and M. Gungor, “Use of Ultra-Wideband Sensor Networks to Detect Safety Violations in Real Time”, 33rd International Symposium on Automation and Robotics in Construction, July 2016, Auburn, Alabama

R Ramos and A. Hoover, “A study of temporal action sequencing during consumption of a meal”, in the proc. of *ACM Conf. on Bioinformatics, Computational Biology and Bioinformatics*, Sept 2013, Washington DC.

B. Suski, S. Banerjee and A. Hoover, “System-Level Noise of an Ultra-Wideband Tracking System”, in the proc. of *IEEE Int’l Conf on Information Science, Signal Processing and their Applications*, July 2012.

S. Banerjee, B. Suski and A. Hoover, “Sensor Set Switching Noise in UWB Indoor Position Tracking”, in the proc. of *IEEE Int’l Conf on Ultra-Wideband*, Sept 2012.

Y. Dong, A. Hoover, J. Scisco and E. Muth, “Detecting Eating Using a Wrist Mounted Device During Normal Daily Activities”, in the proc. of *WorldComp*, July 2011.

A. Hoover, A. Singh, S. Fishel-Brown and E. Muth, “Change point detection via sub-gaussian fitting”, in the proc. of *International Conference on Bioinformatics & Computational Biology*, July 2010, ISBN 1-60132-134-1.

Y. Dong, A. Hoover and E. Muth, “A Device for Detecting and Counting Bites of Food Taken by a Person During Eating”, in the proc. of *IEEE International Conference on Bioinformatics and Biomedicine*, November 2009.

A. Walker, T. Carpenter, J. Moss, F. Switzer, A. Hoover and E. Muth, "The evaluation of virtual environment training for a building clearing task", in the proc. of *Human Factors and Ergonomics Society 53rd Annual Meeting*, pp. 1206-1209, 2009.

K. Waller, A. Hoover and E. Muth, "Methods for the Evaluation of Orientation Sensors", in the proc. of *The 2007 World Congress in Computer Science Computer Engineering, and Applied Computing*, June 2007.

S. Fishel, E. Muth, A. Hoover and L. Gugerty, "Determining the Resolution of a Real-Time Arousal Gauge", *SPIE*, vol. 6218, June 2006.

K. Waller, J. Luck, A. Hoover and E. Muth, "A Trackable Laser Tag System", in the proc. of *The 2006 World Congress in Computer Science Computer Engineering, and Applied Computing*, pp. 416-422, June 2006.

L. Yu and A. Hoover, "Segmentation Methods Through the Stability of Region Count in the Scale-Space", in the proc. of *The 2006 World Congress in Computer Science Computer Engineering, and Applied Computing*, pp. 467-473, June 2006.

R. Schaffer, J. Cohn, A. Hoover, H. Fouad, G. Martin and L. Milham, ``Systems for Evaluating Training Transfer between Virtual and Live Urban Environments'', in proc. of *Huntsville Simulation Conference*, Oct. 2006.

L. Yu, A. Hoover and E. Muth, "Detection of Human Physiological State Change Using Fisher's Linear Discriminant", in the proc. of *HCI International 2005*.

E. Muth, A. Hoover and M. Loughry, "Developing an Augmented Cognition Sensor for the Operational Environment: The Wearable Arousal Meter", in the proc. of *HCI International 2005*.

J. Rand, A. Hoover, J. Pappas, J. Moss, S. Fishel and E. Muth, "Real-time correction of heart interbeat interval data", in the proc. of *Biomonitoring for Physiological and Cognitive Performance during Military Operations, SPIE vol. 5797*, edited by J. Caldwell and N. Wesensten, 2005, pp. 63-70.

L. Yu and A. Hoover, "Threshold Selection as a Function of Region Count Stability", in the proceedings of *IEEE Workshop on Perceptual Organization*, June 2004.

S. Fishel, J. Owens, E. Muth, A. Hoover and J. Rand, "Augmented cognition: Developing and testing a physiology-based task adaptation system", in the proceedings of Human Factors and Ergonomics Society's 48th Annual Meeting, New Orleans, LA, October 2004.

Y. Liu, A. Hoover and I. Walker, "A New Generic Timing Model for Vision Based Tracking in Robotic Systems", in the proceedings of *IEEE/RSJ International Conference on Intelligent Robots and Systems*, October 2003, pp. 248-253.

L. Brandon, A. Hoover and M. Goldbaum, "Drusen Detection in a Retinal Image using Multi-Level Analysis", in the proceedings of *6th International Conference on Medical Image Computing & Computer Assisted Intervention*, November 2003.

Y. Liu, A. Hoover, and I. Walker, "Experiments using a Sensor Network Based Workcell for Industrial Robots", *IEEE International Conference on Robotics and Automation*, Washington, D.C., April 2002, pp. 2988-2993.

R. Pai, A. Hoover and M. Goldbaum "Automated Diagnosis of Retinal Images Using Evidential Reasoning", in the *15th International Conference on Systems Engineering*, Las Vegas, NV, August 2002.

Y. Liu, A. Hoover and I. Walker, "Sensor Network Based Workcell for Industrial Robots", in the proceedings of *IEEE/RSJ International Conference on Intelligent Robots and Systems*, Hawaii, 2001, pp. 1434-1439.

A. Hoover, "Computer Vision in Undergraduate Education: Modern Embedded Computing", in the proceedings of *IEEE Workshop on Combined Research/Curriculum Development in Computer Vision*, Hawaii, 2001.

A. Hoover and B. Olsen, "Sensor Network Perception for Mobile Robotics", in the proceedings of IEEE *International Conference on Robotics and Automation*, San Francisco, CA, 2000, pp. 342-347.

N. DeBardeleben, A. Hoover, W. Jones and W. Ligon, "Parallelization techniques for spatial-temporal occupancy maps from multiple video streams", in the proceedings of *Workshop on Parallel and Distributed Computing in Image Processing, Video Processing, and Multimedia*, Cancun, Mexico, 2000, pp. 202-207.

A. Hoover and B. Olsen, "A Real-Time Occupancy Map from Multiple Video Streams", in the proceedings of IEEE *International Conference on Robotics and Automation*, Detroit, MI, May 1999.

S. Santini, M. Worring, E. Hunter, V. Kouznetsova, M. Goldbaum and A. Hoover, "Database Assisted Image Classification", in the proceedings of *International Conference on Visual Information Systems*, Amsterdam, June 1999.

A. Hoover and B. Olsen, "Path Planning for Mobile Robots Using a Video Camera Network", in the proceedings of IEEE/ASME *International Conference on Advanced Intelligent Mechatronics*, Atlanta, GA, September 1999.

A. Hoover and M. Goldbaum, "Fuzzy Convergence", in the proceedings of *IEEE Computer Vision and Pattern Recognition*, Santa Barbara, CA, 1998, pp. 716-721.

A. Hoover, V. Kouznetsova and M. Goldbaum, "Locating Blood Vessels in Retinal Images by Piece-wise Threshold Probing of a Matched Filter Response", in the proceedings of *American Medical Informatics Association Annual Symposium*, Orlando, FL, 1998.

X. Jiang, A. Hoover, G. Jean-Baptiste, D. Goldgof, K. Bowyer and H. Bunke, "A methodology for evaluating edge detection techniques for range images", in *Asian Conference on Computer Vision*, Singapore, 1995, pp 415-419.

A. Hoover, G. Jean-Baptiste, X. Jiang, P. J. Flynn, H. Bunke, D. Goldgof and K. Bowyer, "Range Image Segmentation: The User's Dilemma", in *IEEE International Symposium on Computer Vision*, Coral Gables, FL, 1995, pp 323-328.

A. Hoover, G. Jean-Baptiste, D. Goldgof and K. Bowyer, "A Methodology for Evaluating Range Image Segmentation Techniques", in *Second IEEE Workshop on Applications of Computer Vision*, Sarasota, FL, 1994, pp 264-271.

A. Hoover, D. Goldgof and K. Bowyer, "Building a B-rep from a Segmented Range Image", in *Second CAD-Based Vision Workshop*, Champion, Pennsylvania, 1994,

pp 74-81.

O. H. Dorum, A. Hoover and J. P. Jones, "Calibration and control for range imaging in mobile robot navigation", in *Proceedings of Vision Interface*, Banff, Alberta, Canada, May 1994, pp 25-32.

L. Stark, A. Hoover, D. Goldgof and K. Bowyer, "Function-Based Recognition from Incomplete Knowledge of Shape", in *IEEE Workshop on Qualitative Vision*, New York, New York, 1993, pp 11-22.

L. Stark, A. Hoover, D. Goldgof and K. Bowyer, "Function-based object recognition from incomplete knowledge of object shape", in *AAAI Workshop on Reasoning About Function*, Washington D.C., 1993, pp 141-148.

A. Hoover, D. Goldgof and K. Bowyer, "Extracting known and inferred shape information from a single view", invited paper in *SPIE #1828: Sensor Fusion V*, Boston, Massachusetts, 1992, pp 2-13

Invited Talks and Other Scholarly Publications

A. Hoover, "Dietary Measurement Trilemma: Accurate, Detailed or Frequent", invited talk at the Nutritional Epidemiology Symposium, sponsored by Indiana University, June 2020, virtual meeting (during pandemic).

A. Hoover, "Tracking Wrist Motion to Measure Energy Intake", invited talk at short course on Mathematical Sciences in Obesity, sponsored by Indiana University, June 2019, Baltimore, MD.

A. Hoover, "Tracking Wrist Motion During Free Living to Detect and Measure Energy Intake", invited talk at the IEEE Workshop on Automated Dietary Monitoring, March 2018, Las Vegas, NV.

Crimarco A, Turner-McGrievy GM, Wilcox S, Boutte A, Muth ER, Hoover A. Association of psychosocial and information processing variables with weight loss in a 6-month behavioral health intervention. Poster presentation to be presented at the annual conference of the Society of Behavioral Medicine, New Orleans, LA. April 2018.

R. Mattfeld, E. Jesch and A. Hoover, "Evaluation of a Commercial Pedometer on Multiple Gait Types Using Video for Ground Truth", poster in the IEEE International Conference on Biomedical and Health Informatics, March 2018, Las Vegas.

S. Sharma, P. Jasper, E. Muth and A. Hoover, "An Evaluation of a Wrist Motion Tracking Algorithm to Detect Eating Activities on 408 People", poster in the IEEE International Conference on Biomedical and Health Informatics, March 2018, Las Vegas.

Turner-McGrievy GM, Dunn CG, Boutté A, Hutto B, Muth E, Hoover A, Wilcox S. "Defining adherence to mobile dietary self-monitoring and assessing tracking over time", poster, Society for Behavioral Medicine; Apr 2018, New Orleans, Louisiana.

Dunn, CG., Turner-McGrievy, GM., Byrd, D., Boutte, A., Muth, E., Hoover, A., Wilcox, S, "User feedback on three different mobile diet tracking methods used in behavioral weight loss interventions", poster, Society for Behavioral Medicine; Apr 2018, New Orleans, Louisiana.

Goldstein, C, Thomas, D, Hoover, A, Bond, D and Thomas, G, "Energy Balance Models & Bite Goals to Maximize Adherence to Weight Loss Treatment: The BITES Pilot Study", poster, Society of Behavioral Medicine, Apr 2018, New Orleans, Louisiana.

Boutté, A.K., Turner-McGrievy, G.M., Wilcox, S., Hutto, B., Muth, E., Hoover, A, "Equal diet quality between two mobile diet tracking devices in the DIET Mobile study: A remotely-delivered weight loss study", poster, Society of Behavioral Medicine, Apr 2018, New Orleans, Louisiana.

Carly M. Goldstein, Diana Thomas, Adam Hoover, Dale S. Bond, J. Graham Thomas, "Pilot Study of Energy Balance Models & Bite Goals to Build Adherence to Online Weight Loss Treatment", poster, The Obesity Society annual meeting, Nov 2017, Washington DC.

A. Hoover, "REU 25 years later: A journey to NIH research in energy intake", invited talk at University of Central Florida, July 2017, Orlando, FL.

A. Hoover, "Bite measurements and what they can tell us", invited talk at University of Alabama at Birmingham, School of Public Health, June 2017, Birmingham, AL.

A. Hoover, "Bite Counter", invited talk at Northwestern University, June 2017, Chicago, IL.

Hoover, A., & Sazonov, E. Measuring Human Energy Intake and Ingestive Behavior: Challenges and Opportunities. *IEEE Pulse*, 7(6), 2016, pp. 6-7.

A. Hoover, "Bite measurement methods and models", invited talk at University of Alabama at Birmingham, School of Public Health, June 2016, Birmingham, AL.

A. Hoover, "Tracking Wrist Motion to Monitor Energy Intake", invited talk at University of Alabama at Birmingham, School of Public Health, June 2015, Birmingham, AL.

A. Hoover, "Measuring Human Energy Intake", invited talk at Bringham Young University, April 2015, Provo, UT.

A. Hoover, "Tracking Wrist Motion to Monitor Energy Intake", invited talk at the Wireless Health 2013 conference, Johns Hopkins University, November 2013, Baltimore, MD.

A. Hoover, "Wrist Motion Tracking to Detect Eating Activities and Measure Eating Intake", invited talk at the Pennington Biomedical Research Center, Louisiana State University, April 2012, Baton Rouge, LA.

A. Hoover, "Measuring Digital System Latency from Sensing to Actuation at Continuous 1 ms Resolution", invited talk at the 2011 VIMS workshop, part of the HFES annual meeting, Las Vegas, NV.

A. Hoover and E. Muth, "The Calorie Watch: Accuracy and Applications", invited poster at the 2012 Obesity Retreat, Medical University of South Carolina, October 2012.
Scisco JL, Muth ER, Dong Y, Hoover AW, O'Neil PM, & Fishel-Brown SR (2011). Usability and acceptability of the "bite counter" device. *Proceedings of the Human Factors and Ergonomics Society 55th Annual Meeting*. [oral presentation]

Zielinski M, Blades C, Scisco JL, Hoover AW & Muth ER (2011, March). The number of pieces a portion is divided into impacts perceived consumption. Poster presented at the 69th Annual Meeting of the American Psychosomatic Society, San Antonio, TX.

Fishel-Brown SR, Scisco JL, Hoover AW & Muth ER (2010, October). Energy balance understanding does not predict measures of wellness. *Obesity, 18*(S2), S118-S119. Poster presented at the 28th Annual Meeting of the Obesity Society, San Diego,CA.

Scisco JL, Muth ER, Hoover AW, Dong Y, Hill LK, Wiles M, & Harris S (2010, July). An environmental cue to eat slowly reduces food consumption. *Appetite, 54*(3), 674. Poster presented at the 18th Annual Meeting of the Society for the Study of Ingestive Behavior, Pittsburgh, PA.

S. Fishel, E. Muth, R. Herron, A. Hoover and J. Rand, "Accuracy of a low-cost heart rate monitor for research involving inter-beat interval recording", poster, 44th Annual Meeting of the Society for Psychophysiological Research, Sante Fe, New Mexico, October 2004.

A. Hoover and M. Goldbaum, "Illumination equalization of a retinal image using blood vessels as a reference", abstract in *ARVO Investigative Ophthalmology and Visual Science*, 2001.

T. Christensen, M. Noergaard, C. Madsen and A. Hoover, "Sensor Networked Mobile Robotics", demonstration in *IEEE Computer Vision and Pattern Recognition*, Hilton Head, SC, 2000, pp. 782-783.

A. Hoover and B. Olsen, "Sensor Networked Robotics", video (reviewed) in the video proceedings of *IEEE International Conference on Robotics and Automation*, Detroit, MI, May 1999.

M. Goldbaum, A. Hoover, V. Kouznetsova and H. Chen, "Automatic Identification of Blood Vessels in Complex Retinal Images", abstract in *ARVO Investigative Ophthalmology and Visual Science*, 1999.

S. Brown, D. Granet, A. Hoover, D.-U. Bartsch and B. Brody, "Objective Computerized Image Analysis of Digital Photoscreening for Ocular Disorders in Children", abstract in *American Association for Pediatric Ophthalmology and Strabismus* Annual Meeting, Toronto, April 1999.

M. Goldbaum, E. Hunter, A. Hoover, V. Kouznetsova, H. Chen and R. Jain, "A Bayesian Network for Automated Diagnosis of Ocular Fundus Images", abstract in *ARVO Investigative Ophthalmology and Visual Science*, 1998, pg S468.

A. Hoover, M. Goldbaum, A. Taylor, J. Boyd, T. Nelson, S. Burgess, G. Celikkol and R. Jain, "Schema for Standardized Description of Digital Ocular Fundus Image Contents", abstract in *ARVO Investigative Ophthalmology and Visual Science*, 1997, pg S1122.

M. Goldbaum, A. Hoover, A. Taylor, J. Boyd, T. Nelson, S. Burgess, G. Celikkol and R. Jain, "World Wide Web Distributed Processing of Ocular Fundus Images", abstract in *ARVO Investigative Ophthalmology and Visual Science*, 1997, pg S218.

A. Hoover, "The OPUS (Object Plus Unseen Space) Model", poster at *SPIE #1964 Applications of Artificial Intelligence: Machine Vision and Robotics*, Orlando, FL, 1993.

PATENTS

A. Hoover, E. Muth and Y. Dong, "Weight Control Device Using Bites Detection", USA, Patent No. 8310368, filed January 2009, granted November 13, 2012.

A. Hoover, E. Muth, Y. Dong and J. Scisco, "Device and Method for Detecting Eating Activities", USA, Patent No. 9685097, filed July 2012, granted June 20, 2017.

A. Hoover, S. Brown, B. Brody, D.-U. Bartsch and D. Granet, "Automated Photorefractive Screening", USA, Patent No. 6089715, filed October 1998, granted July 18, 2000.

SPONSORED RESEARCH ($9.8M total, $4.4M personal expenditures)

Optimizing Just-in-Time Adaptive Intervention to Improve Dietary Adherence in Behavioral Obesity Treatment: A Micro-randomized Trial, NIH, subcontract from The Miriam Hospital at Brown University, co-PI, $2,607,792 ($150,264), 2020-2024.

Predictive Analysis of Manufacturing, BMW and SC Dept of Commerce, co-PI, $300,000 ($22,695), 2021-2022.

Advanced Visual Inspection System, Samsung and SC Dept of Commerce, PI, $300,000 ($300,000), 2020-2021.

Visual Defect and Inspection System, Samsung, PI, $140,624 ($140,624), 2018-2019.

Using Context to Validate and Improve Wrist-Tracking Measures of Eating Activity, NIH, PI, $1,746,064 ($702,656), 2015-2019.

Assessing the Bite Counter as a Tool for Food Intake Monitoring: Phase 2, NIH, PI, $984,668 ($406,054), 2014-2017.

Increasing Dietary Self-Monitoring and Weight Loss in an Mhealth Intervention, NIH, co-I, $275,000 ($20,000), 2015-2016.

Automated Visual Inspector, BMW, PI, $323,176 ($323,176), 2013-2015.

Portable Hardware for Sensorimotor Adaptation, NASA, PI, $37,676 ($18,838), 2013-2014.

Assessing the Bite Counter as a Tool for Food Intake Monitoring, NIH, PI, $148,556 ($74,278), 2011-2012.

Assessing the Bite Counter as a Tool for Weight Loss, South Carolina Clinical and Translational Research Institute, co-PI, $49,024, 2011-2012.

Designing better virtual environments for training, ONR, Co-PI, $704,426 ($352,213), 2010-2012.

Bite Technologies: The Bite Counter, South Carolina Launch, PI, $49,050, 2010-2011.

Measuring Performance using Human Movement Tracks in Ambiguous Physical Environments, ONR, PI, $916,525 ($412,436), 2007-2010.

Establishing Team Training Metrics through the use of a Virtual Training Lab II, ONR, Co-PI, $790,000 ($395,000), 2005-2008.

Urban Operations Live Training Database, U.S. Army thru ITT Industries, PI, $63,492 ($21,587), 2005-2007.

Cognitive Information Processing Technology Project, DARPA thru Honeywell, Co-PI, $190,000 ($95,000), 2003-2004.

Establishing Team Training Metrics Through the use of a Virtual Training Lab, ONR, Co-PI, $618,533 ($235,043), 2003-2006.

Modern Embedded Computing, National Science Foundation, PI, $75,000 ($56,250), 2003-2005.

Arousal Meter Gauge, Integration, Testing and Upgrades, DARPA thru Boeing, Co-PI, $45,000 ($22,500), 2003-2005.

Sensor Based Dynamic Manipulation in Unpredicted Motion, Office of Naval Research, PI, $145,562 ($72,781), 2002-2003.

Enhancement of Training and Performance Through Man-Machine Interactions, DARPA thru ONR, Co-PI, $459,262 ($183,705), 2001-2003.

The Four-Dimensional Robot Workcell, South Carolina Commission on Higher Education, PI, $92,801, ($92,801), 2000-2001.

Equipment grant from Staubli Corporation, PI, $40,000 ($40,000), 2000-2001.

STARE: STructured Analysis of the Retina, NIH thru University of California, San Diego, PI, $155,901, ($155,901), 2000-2003.

GRADUATE STUDENT ADVISING

PhD Graduates (10 total)

Sharma, S, “Detecting periods of eating in everyday life by tracking wrist motion - What is a meal?”, (August 2020).

Shen, Y, “Using Contextual Information to Improve Hidden Markov Model Recognition of Wrist Motions During Eating Activities”, (December 2018).

Mattfeld, R, “Evaluation of Pedometer Performance Across Multiple Gait Types Using Video for Ground Truth”, (May 2018).

Kwon, JP "Filtering Impulses in Dynamic Noise in The Presence of Large Measurement Noise", (August 2015).

Ramos Garcia, R., “Using Hidden Markov Models to Segment and Classify Wrist Motions Related to Eating Activities", (May 2014).

Banerjee, S., “Improving Accuracy in Ultra-Wideband Indoor Position Tracking through Noise Modeling and Augmentation”, (December 2012).

Suski, W., “A Study of Environment Noise in Ultra-Wideband Indoor Position Tracking”, (May 2012).

Dong, Y., “Tracking Wrist Motion to Detect and Measure the Eating Intake of Free-Living Humans”, (May 2012).

Yu, L., "On the stability of region count in the parameter space of image analysis methods", (December 2007).

Liu, Y., "Dynamic sensing and manipulation in an industrial robot workcell", (May 2004).

Master’s Thesis Graduates (35 total)

Wei, W., "Individualized wrist motion models for detecting eating episodes using deep learning", (May 2021).

Lin, B., "Machine Learning and Pedometers: An Integration-Based Convolutional Neural Network for Step Counting and Detection", (December 2020).

Luktuke, Y, "Segmentation and recognition of eating gestures from wrist motion using deep learning", (May 2020).

Khare, V, "Training a camera based inspection system for appearance variability", (August 2020).

Shumpert, B. “A Method to Automatically Learn Appearance Variability in Machine Parts During Appliance Manufacturing”, (May 2019).

Mathew, S. "Detection and Recovery from Camera Bump during Automated Inspection of Automobiles on an Assembly line", (December 2015).

Ramaraj, M. "A Training Assistant Tool for the Automated Visual Inspection System", (December 2015).

Puthumanappilly, J. "Detecting Occlusions of Automobile Parts Being Inspected By a Camera System During Manufacturing Assembly", (August 2015).

Yu, X. "A study of the regularity of autocorrelation of manipulation of wrist motion during eating", (December 2014).

Sharma, S. "A device to record natural daily wrist motion", (December 2014).

Mattfeld, R. “Automatically Measuring Individual Consumption Events During Natural Eating Using a Table Embedded Scale”, (August 2014).

Krishnan, H., "Ultra-wideband position tracking on an assembly line", (May 2014).

Reyes, J. "A study of time-based features and regularity of manipulation to improve the detection of eating activity periods during free living", (May 2014).

Eskandari, S., "Bite Detection and Differentiation using Templates of Wrist Motion", (December 2013).

Huang, Z., “An Assessment of the Accuracy of an Automated Bite Counting Method in a Cafeteria Setting", (August 2013).

Wu, W., “Measuring Digital System Latency from Sensing to Actuation at Continuous 1 Millisecond Resolution”, (December 2011).

Drennan, M., “An assessment of linear wrist motion during the taking of a bite of food”, (May 2010).

Ganjali, D., “Filtering noise caused by sensor selection for an ultra-wideband position tracking system”, (December 2009).

Dong, Y., “A Device for Detecting and Counting Bites of Food Taken by a Person During Eating”, (August 2009).

Singh, A., “Automated State Change Detection of a Gaussian Distributed Signal”, (August 2008).

Epton, E., “Odometry correction of a mobile robot using a range-finding laser”, (December 2007).

Lowe, K., “Distance estimation between transceivers over short distances”, (December 2007).

Waller, K., “Developing a benchmark suite for the evaluation of orientation sensors’’, (December 2006).

Werner, M., “Using a spline to model the motion of a 4-man fireteam during building clearing exercises”, (December 2006).

Luck, T., “A wirelessly trackable weapon for military training”, (May 2005).

Rickenbach, P., (MS), “Pin-level simulation of an embedded microprocessor”, (August 2005).

Rand, J., "Real-time detection and correction of errors in heart interbeat interval", (August 2005).

Peddamallu, S., “An embedded systems bus monitor”, (August 2005).

Hughes, J., "A comparison of methods for automated shadow detection", (December 2005).

Sagiraju, K., “A pin-level simulation environment for embedded system design”, (December 2005).

Joseph, M., “Real-time shadow detection using multiple viewpoints”, (May 2004).

Dsouza, S., "A State Switching Kalman Filter", (August 2004).
Brandon, L., "Automated drusen detection in a retinal image using multi-level analysis", (May 2003).
Pai, R., "Automated diagnosis of retinal images using evidential reasoning", (December 2001).
Abdul, N., "Artery/vein classification in retinal imagery", (December 2001).

Current Graduate Advising

Mayyan, M. (PhD), expected graduation May 2022
Tang, Z. (PhD), expected graduation August 2023
Jolly, J. (PhD), expected graduation August 2023
Patyk, A. (MS), expected graduation August 2021
Gupta, S. (MS), expected graduation August 2021
Younginer, C. (MS), expected graduation August 2021
Zhang, T. (MS), expected graduation December 2021

Undergraduate Honor's Thesis Advisees

Heather Bryant, Roopam Master, Will Jeter, Sean McCall, Lee Brandon, Matthew Poeta, David Glandon, Jonathan Goforth, Peter Rickenbach, Megan Becvarik, Mike Wooten, Ben Shumpert, Basil Lin, John Lawler, Cameron Burroughs

Visiting Scholoars

Bent Olsen (Aalborg University), Thomas Chirstensen (Aalborg University), Mads Norgaard (Aalborg University)

TEACHING (* indicates course created and developed by me)

*ECE 222, System Programming Concepts, F05, S06, F06, S09.
ECE 272/272L, Computer Organization, F99, S00.
ECE 429/629, Organization of Computers, S99, S00, F00, S01, F01, F02.
ECE 453, Software Practicum, S02, F03, F04.
*ECE 468/668L, Embedded Computing, S01, S02, S03, F03, S04, S05, S07, S08, S09, S11, S12, S13, S14, S18, S19, S20, S21.
*ECE 431/631, Introduction to Computer Vision, F13, F14, F15, F17, F18, F19, F20.
ECE 493, Computer Systems Security, S01, F01.
*ECE 854, Analysis of Tracking Systems, F02, F04, F06, F07, F08, F09, F10, F11, F12, F13, F14, F15, F17, F18, F19, F20.
*ECE 893, Machine Vision, F01, S03.

PROFESSIONAL ACTIVITIES

Steering Committee, IEEE Journal of Biomedical and Health Informatics (2018-2020)
Associate Editor, IEEE Journal of Biomedical and Health Informatics (2014-)
Founding Member, eHealth/mHealth section of The Obesity Society (2012-)
Panel Reviewer, 1) NSF (2000-2004, 2012-), 2) NIH (2011-)
Most Recent Conference Program Committee: 2019 IEEE BHI/BSN (https://www.bhi-bsn-2019.org/).
Journal Guest Editor, 1) Computer Vision and Image Understanding special issue on Empirical Evaluation of Computer Vision Algorithms, 2001
Journal Technical Reviewer, 1) IEEE Transactions on Pattern Analysis and Machine Intelligence, 2) IEEE Transactions on Biomedical Engineering, 3) IEEE Transactions on Medical Imaging, 4) Medical Engineering and Physics, 5) Computer Vision and Image Understanding, 6) IEEE Journal of Biomedical and Health Informatics, 7) Image and Vision Computing, 8) Machine Vision and Applications, 9) IEEE Transactions on Systems, Man and Cybernetics, 10) Physics Review E, 11) Medical Image Analysis, 12) IEEE Transactions on Robotics and Automation, 13) IEEE Transactions on Education, 14) IEEE Transactions on Image Processing, 15) Pattern Recognition Letters

Textbook Reviewer, 1) Morgan Kaufmann, 2) McGraw-Hill, 3) John Wiley & Sons

UNIVERSITY AND PUBLIC SERVICE

Committees

Department: Member, Undergraduate Curriculum (2000-2009)
Department: Chair, Graduate Curriculum (2014 -2015)
Department: Member, Graduate Curriculum (2009-)
Department: Chair, CpE Faculty Search (20012 -)
Department: Member, Faculty Search (2001 -)

Pedagogy

Administration of Measure of Software Similarity (MOSS) system (was developed by Alex Aiken at Stanford University) for detecting plagiarism in programming assignments; open to use by all faculty (2002-).
Indoctrination of dual-boot laptops for all CpE undergraduate majors (2006-).
Redesign of undergraduate curriculum for CpE (2000,2005).
Redesign of PhD qualifying exam for ECE dept (2010).
Over 5,000 visitors during tours for high school seniors (weekly), college freshmen (10 times per semester), WISE and other groups have been given demonstrations in my lab of tracking systems and computer engineering (2002-).

HONORS AND AWARDS

Harris Teaching Award, Dept of Electrical & Computer Engineering, Clemson University, 2020
University Research, Scholarship and Artistic Achievement Award, 2018
Harris Teaching Award, Dept of Electrical & Computer Engineering, Clemson University, 2011
Faculty Collaboration Award, College of Engineering and Science, Clemson University, 2009
Murray Stokely Award, Excellence in Teaching, College of Engineering and Science, Clemson University, 2006.
Honorary Graduate Teaching Award, Department of Electrical and Computer Engineering, University of California, San Diego, 1997-1998 academic year.
NASA Florida Space Grant Consortium Graduate Fellowship, 1993-1996.
Department of Energy Graduate Fellowship, Oak Ridge National Labs, 1993.

COMMERCIALIZATION

Co-founder of Clemson startup Bite Technologies in Clemson, SC to commercialize energy intake self-monitoring device. State and NIH funding totaling $1.25M. “Bite Counter” sold since 2011.
Software license from Clemson University to UFI Corp., Morrow Bay CA, for heartrate variability monitoring. “Wearable Arousal Meter” sold since 2003.
Co-founder of UCSD startup EyeDx Inc. in San Diego CA to commercialize a children's vision screening system. Angel investing totaling $675,000. Partnered with Kodak for device manufacturing. Company operated 1998-2003.

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