Howard Edward Neely, III
Chief Technology Officer
Three Birds Systems
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Expert in the development of embedded system software for computationally intensive applications, with more than 35 years of experience in system analysis, software engineering, and technical team leadership.

Work History:

1997-2013, Research Project Manager, HRL Laboratories, LLC, Malibu, CA

- Developed software architecture and led HRL team to transition research tracking algorithms into COTS embedded processor hardware for an emerging surveillance UAV product.
- Led HRL team in transition of advanced 3D human tracking algorithms to custom embedded processor (based on COTS chips) for real-time, wide-area human-robot safety on the factory floor as part of a multi-national collaboration.
- Developed software architecture and led HRL team to transition research human detection algorithms into COTS embedded processor as part of a bolt-on ground vehicle autonomy product prototype.
- Developed software that automatically converts video surveillance metadata into a graph data structure suitable for analogical processing on a massively parallel machine.
- Developed embedded software for the world's first inertially-stabilized augmented reality system that can operate in an unstructured outdoor environment.

1989-1997, Sr. Scientist/Engineer, Electro-Optical Systems, Hughes Aircraft Company, El Segundo, CA

- Co-architected the Array Control Unit for the SIMD array of the Image Understanding Architecture, a heterogeneous, hierarchical parallel machine for computer vision applications.
- Principal Investigator and Program Manager on the Improved Space Computer Program (ISCP) Science and Technology program from the USAF Phillips Laboratories. Performed analysis of processing requirements for emerging spacecraft sensor payloads, developed data for performance-level models of the processing, and collaborated with Honeywell Space Systems Division in the interpretation of the results. Developed and analyzed a notional sensor and onboard processing architecture for a hyperspectral imaging payload.

1988-1989, Engineering Specialist, Lear Astronics Corp, Santa Monica, CA

- Technical Director of the Integrated Control Avionics for Air Superiority project, with responsibilities for system architectural design, leading the development of a runtime system for multiprocessor execution of Ada-coded avionics, and hardware architectural design of an R3000 RISC-processor-based multiprocessor system.

1977-1988, Electro-Optical and Data Systems Group, Hughes Aircraft Company, El Segundo, CA

- Performed embedded hardware and software engineering of digital servo signal processing and servo supervisory systems for: Boost Surveillance and Tracking System Program (7/87-4/88), F-14D Antenna Unit Program (8/85-6/87), Sealite Beam Director Program (6/80-8/85), and the Target Euler Angle Simulation Equipment Program (6/77-6/80).

Patents:

US 7,120,875 B2, Daily, Michael J., Ronald T. Azuma, Howard E. Neely, III, Gerald B. Isdale, Method and Apparatus for Augmented Reality Hybrid Tracking System with Fiducial-Based Heading Correction, filed October 29, 2002, issued October 10, 2006, assigned to X-Labs Holdings, LLC.

US 7,127,082, Neely, Howard, Active Fiducials for Augmented Reality, filed September 27, 2002, issued October 14, 2006, assigned to HRL Laboratories, LLC.

US 7,269,623, Neely, Howard E. III, Jason R. Fox, Peter A. Tinker, Jason J. Jerald, System and Method for Distributed Multimodal Collaboration Using a Tuple-Space, filed January 9, 2003, issued September 11, 2007, assigned to Raytheon Company.

US 7,599,789 Jon Leonard, Neely, Howard E. III, Ronald Azuma, Michael Daily, Beacon-Augmented Pose Estimation, filed May 24, 2006, issued October 6, 2009, assigned to Raytheon Company.

US 7,646,394 Howard Neely, III; Jason Fox; Mathias Kolsch; Jason Jerald; Mike Daily, System and method for Operating in a Virtual Environment, filed March 7, 2005, issued January 12, 2010, assigned to HRL Laboratories.

US 7,667,700, Howard Neely, III; Jason Fox; Mike Daily; System and method for navigating operating in a virtual environment, filed March 7, 2005, issued February 23, 2010.

US 7,796,155, Neely, Howard, Gerald Isdale, Mike Daily, Ronald Azuma, Method and Apparatus for Real-Time Group Interactive Augmented-Reality Area Monitoring, Suitable for Enhancing the Enjoyment of Entertainment Events, filed December 20, 2004, issued September 14, 2010.

US 7,893,935, Neely, III; Howard, Fox, Jason, Kölsch, Mathias, Shomphe, Matthew, Jerald, Jason, Method and system for hybrid trackball and immersive navigation in a virtual environment, filed Nov. 30, 2009, issued Feb. 22, 2011.

US 8,554,710, Neely, III, Howard E., Robert S. Belvin, Michael J. Daily, Converting Video Metadata to Propositional Graphs for Use in an Analogical Reasoning System, filed Feb. 11, 2011, issued Oct. 8, 2013.

Selected Publications:

Neely, Howard E.; Belvin, Robert S.; Daily, Michael J.; , "Modeling threat behaviors in surveillance video metadata for detection using an analogical reasoner," *Aerospace Conference, 2010 IEEE* , pp.1-9, 6-13 March 2010, http://dx.doi.org/10.1109/AERO.2010.5446805

Ronald Azuma, Howard Neely III, Mike Daily, Jon Leonard. Performance Analysis of an Outdoor Augmented Reality Tracking System that Relies Upon a Few Mobile Beacons. *Proc. IEEE and ACM Int'l Symp. on Mixed and Augmented Reality (ISMAR 2006)* (Santa Barbara, CA, 22-25 Oct. 2006), pp. 101-104, http://dx.doi.org/10.1109/ISMAR.2006.297798.

Neely, Howard E. III, Robert S. Belvin, Jason R. Fox, Michael J. Daily, Multimodal Interaction Techniques for Situational Awareness and Command of Robotic Combat Entities, *2004 IEEE Aerospace Conference Proceedings* (Big Sky, MT, 6-13 March 2004), pp. 3297-3305, http://dx.doi.org/10.1109/AERO.2004.1368136.

Ronald Azuma, Howard Neely III, Michael Daily, Ryan Geiss. Visualization Tools for Free Flight Air-Traffic Management. *IEEE Computer Graphics and Applications 20*, 5 (Sept/Oct 2000), 32-36, http://dx.doi.org/10.1109/38.865877.

Azuma, Ronald, Howard Neely III, Mike Daily, Mario Correa. Visualization of Conflicts and Resolutions in a "Free Flight" Scenario. *Proceedings of IEEE Visualization '99* (San Francisco, CA, 24-29 October 1999), 433-436, 557, http://dx.doi.org/10.1109/VISUAL.1999.809923.

Azuma, Ronald, Bruce Hoff, Howard Neely III, Ron Sarfaty. A Motion-Stabilized Outdoor Augmented Reality System. *Proceedings of IEEE VR '99* (Houston, TX, 13-17 March 1999), 252-259, http://dx.doi.org/10.1109/VR.1999.756959.

Education:

MS, EE, University of Southern California, 1981
BS, EE (honors), Michigan State University, 1977

Technical Expertise:

- Languages: Ada, C, C++, CUDA, HTML, Java, Python, SQL, SystemC, VHDL, XML.
- APIs: DirectX, MPI, OpenCL, OpenCV, OpenGL, OpenMP.
- Platforms: Windows, Ubuntu Linux, QNX.

Certifications:

- LARTA University Entrepreneur Training Series, April 2003.
- Stanford Certified Project Manager, Organizational Mastery, November 2002.
- Stanford Certified Project Manager, Individual Mastery, July 2002.
- UCLA Anderson Graduate School of Management, Hughes Executive Marketing Program, Dec. 1996.

Awards:

- 2011 HRL Award, Boeing Contribution.
- 2012 HRL Award, Technology Transition.

Other Achievements:

- Track & Field:
    - 6 Big Ten Conference championship meet medals.
    - 4 MSU varsity letters.
    - 1975 AAU (Amateur Athletic Union) National Junior Champion, 400m intermediate hurdles.