

# LESTER D. NELSON

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Senior innovator specializing in the development and deployment of novel human computer interactions that help people have more effective and rewarding experiences when using technology.

## EXPERIENCE

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2004 - Present Palo Alto Research Center, Inc. Palo Alto, California

*Member of Research Staff*

Research and Development in Human-Computer Interaction relating to explainable artificial intelligence and use of augmented reality technology for facilitating complex work task learning and use. Other projects include user research, system and interaction design, and development of server and mobile interface software (Android and iOS) for health behavior change programs and related content authoring tools; leading an evaluation of performance factors when using a social annotation (tagging) system, developing new technologies for collaboration (email-based social tagging, selective sharing of content using active keyword tags), conducting fieldwork, intellectual property development and prototyping for informal information sharing in organizations. Research also focused on end-user innovations including Web mashups and adaptable application/service design, and usable access control. Also provided management consulting to a multi-national client on tools for system engineering. Work products include prototypes, patents, presentations, and publications.

1995 - 2004 FX Palo Alto Laboratory Palo Alto, California

*Senior Research Scientist*

Research in Human-Computer Interaction relating to ubiquitous computing, mobile computing, and social technologies. Responsibilities included leadership and participation in HCI projects. Resulting commercial products included interactive public displays for information sharing both online and in physical places (cafés and offices), and physically embodied interfaces for manipulating digital media presentations. Research products include two products, 25 U.S. patents, prototypes, presentations, and publications.

1988 - 1995 Lockheed Missiles & Space Company Palo Alto, California

*Data Systems Engineer, Software Systems Consultant, Reengineering Project Manager*

Research in Software Engineering relating to the tools and practices for development of large-scale, real-time, mission critical systems. Domains of application were computer aided software engineering, software reuse, and software reengineering. Responsibilities included technology transfer to product organizations, and management consulting on software engineering in the formation of a joint-venture software company (Telstar Systems of Australia).

1983 - 1987 IBM/Federal Systems Division Owego, New York

*Senior Associate Programmer*

Programming of large-scale, real-time, mission critical systems. Responsibilities included the detailed design, code, and test of software components, and the development of tools for programming teams a standard text editor.

# LESTER D. NELSON

## EDUCATION

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1985 - 1987 State University of New York Binghamton, New York, USA  
38 Graduate Credits, Systems Sciences, Course work funded by IBM in Modeling and Simulation and other areas of Systems Science, GPA 4.0

1979 - 1982 University of Wisconsin, Madison, Wisconsin, USA  
MSCS, Major: Mathematical Programming

1975 - 1979 Trinity College, Hartford, Connecticut, USA  
BS, Major: Mathematics and Computing Engineering

## INVENTIONS AND PUBLICATIONS

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2001 – Present: 34 US Patent Granted: 6175954, 6195093, 6320496, 6509909, 6580438, 6732915, 6773177, 6823184, 6941342, 6992702, 7013279, 7089278, 7106852, 7249327, 7251316, 7272563, 7286649, 7519573, 7546143, 7577916, 7610563, 7823070, 7836409, 7933889, 8131762, 8504626, 8612845, 8666979, 8966362, 9137190, 9613079, 9672482, 9898789, 10235019

1990-Present: 59 Peer Reviewed Research Publications in international research conferences, workshops, journals, and book chapters.

## SYSTEMS SKILLS

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Professional programming in 29 programming languages, most recently C#/Unity, Javascript/Meteor, Javascript/MEAN, Python/Django, and HTML/CSS; with development experience including Mac OS, Unix (Ubuntu, BSD), and Windows (versions 10, NT, XP).

## OPEN SOURCE SOFTWARE RELEASE

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2018, Fittle, a mobile app and cloud-based server for running health behavior change research studies, available at [github.com/PARC/fittle](https://github.com/PARC/fittle)

## ACTIVITIES AND AWARDS

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1999 - Present Member of Association of Computing Machinery  
2017 PARC Golden Acorn Award (for significant patenting)  
2010 Awarded Senior Membership in the Association of Computing Machinery  
2008 PARC Appreciation Award Going Above & Beyond  
2006 PARC Outstanding Performance Delivering Results  
1996 – 2004 FXPAL Significant Achievement Award ('96,'99, '01, '04)  
1994 Lockheed Corporation Pursuit of Excellence Award  
1979 President's Fellow, Trinity College

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## DETAILED WORK PRODUCTS LIST

### PUBLICATIONS

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Mohan, S.; Ramea, K.; Price, R.; Shreve, M.; Eldardiry, H.; Nelson, L. Building JARVIS: Towards Real-time Contextual Planning for Live Instructional Support for Physical Tasks. AAAI Workshops, 2019.

Pirolli, P., Youngblood, G. M., Du, H., Konrad, A., Nelson, L. & Springer, A. Scaffolding the Mastery of Healthy Behaviors with Fittle+ Systems: Evidence-Based Interventions and Theory. *Hum.-comput. interact.* , 1-34, 2018.

Springer A, Venkatakrisnan A, Mohan S, Nelson L, Silva M, Pirolli P, Leveraging Self-Affirmation to Improve Behavior Change: A Mobile Health App Experiment, JMIR Mhealth Uhealth 2018;6(7)

Pirolli P, Mohan S, Venkatakrisnan A, Nelson L, Silva M, Springer A, Implementation Intention and Reminder Effects on Behavior Change in a Mobile Health System: A Predictive Cognitive Model, J Med Internet Res 2017;19(11):e397, 2017.

Hartzler, A.L., Venkatakrisnan, A., Moham, S., Silva, M., Lozano, P., Ralston, J.D., Ludman, E., Rosenberg, Newton, K.M., Nelson, L., Pirolli, P., Acceptability of a team-based mobile health (mHealth) application for lifestyle self-management in individuals with chronic illnesses, IEEE Engineering in Medicine and Biology Society, EMBC 2016, 2016.

Konrad, A., Bellotti, V., Crenshaw, N., Tucker, S., Nelson, L.D., Du, H., Pirolli, P., Whittaker, S., Finding the Adaptive Sweet Spot: Balancing Compliance and Achievement in Automated Stress Reduction, to appear in Proc. 33th Annual CHI Conference on Human Factors in Computing Systems (CHI 2015), 2015.

Wagner, C., Liao, V., Pirolli, P., Nelson, L.D., Strohmaier, M., It's Not in Their Tweets: Modeling Topical Expertise of Twitter Users, Proceeding of SOCIALCOM-PASSAT '12 Proceedings of the 2012 ASE/IEEE International Conference on Social Computing and 2012 ASE/IEEE International Conference on Privacy, Security, Risk and Trust, IEEE Computer Society, 2012.

Hanrahan, B.V., Convertino, G., Nelson, L.D., Modeling problem difficulty and expertise in stackoverflow, Proceedings of the ACM 2012 conference on Computer Supported Cooperative Work Companion, CSCW'12, 2012.

Yee, N.; Ducheneaut, N.; Nelson, L.D., Through the Azerothian Looking Glass: Mapping In-Game Preferences to Real World Demographics, Proc. 30th Annual CHI Conference on Human Factors in Computing Systems (CHI 2012), 2012.

Yee, N.; Ducheneaut, N.; Nelson, L.D., Online Gaming Motivations Scale: Development and Validation, Proc. 30th Annual CHI Conference on Human Factors in Computing Systems (CHI 2012), 2012.

Nelson, L., Convertino, G., Chi, E. H., Nairn, R., Studying the Adoption of Mail2Tag: an Enterprise2.0 Tool for Sharing, ECSCW 2011: Proceedings of the 12th European Conference on Computer Supported Cooperative Work, Springer 2011.

Nelson, L., Convertino, G., Nairn, R., Chi, E. H., Mail2Tag: information sharing through augmenting email practices with implicit tag-based categorization, Proc. of The 2011 International Conference on Collaboration Technologies and Systems (CTS 2011), 2011.

Yee, N., Ducheneaut, N., Yao, M., Nelson, L., Do men heal more when in drag? Conflicting identity cues between user and avatar, Proc. 29th Annual CHI Conference on Human Factors in Computing Systems (CHI 2011), 2011.

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## DETAILED WORK PRODUCTS LIST

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### PUBLICATIONS (CONTINUED)

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Yee, N., Ducheneaut, N., Nelson, L., Likarish, P., Introverted elves & conscientious gnomes: the expression of personality in World of Warcraft, Proc. 29th Annual CHI Conference on Human Factors in Computing Systems (CHI 2011), 2011.

Nelson, L., Convertino, G., Mail2Tag, Case Study of Design Using Multiple Aspects of Appropriation, CHI 2011 Extended Abstracts on Human Factors in Computing Systems, ACM, 2011.

Chen, J., Naim, R., Nelson, L., Chi, E. H., Short and tweet: experiments on recommending content from information streams. Proceedings of ACM CHI 2010, 2010.

Jones, M.C., Churchill, E.F., Nelson, L.D., Mashed layers and muddled models: Debugging mashup applications, In: Cypher, A., Dontcheva, M., Lau, T. and Nichols, J. (eds.), No Code Required: Giving Users Tools to Transform the Web, Morgan Kaufmann, 2010, pp. 423-438, 2010.

Nelson, L., Naim, R., Chi, E.H., Mail2Tag: Efficient Targeting of News in an Organization, CSCW 2010 Demonstration and Workshop Paper: Collective Intelligence In Organizations, CSCW2010, 2010.

Convertino, G. ; Hong, L. ; Nelson, L. ; Pirolli, P. L. ; Chi, E. H. Activity awareness & social sensemaking 2.0: design of a task force workspace . Proceedings of HCI International 2009 - Thematic Area: Augmented Cognition; 2009 July 19-24; San Diego, CA., 2009.

Nelson, L., Convertino, G., Pirolli, P. L., Hong, L., Chi, E. H., Impact on process by a social annotation system: a social reading experiment. Proceedings of HCI International 2009, 2009.

Churchill, E.F. and Nelson, L.D, Media Spaces to Placed Media: Ubiquitous Computing, Community Network and Public Space Publishing, in Media Space 20+ Years of Mediated Life, Chapter 5, Springer Series Computer Supported Cooperative Work, Harrison, Steve (Ed.), 2009.

Nelson, L.; Held, C.; Pirolli, P. L.; Hong, L.; Schiano, D. J.; Chi, E. H. With a little help from my friends: examining the impact of social annotations in sensemaking tasks. exten

Dalal, B.; Nelson, L.; Smetters, D. K.; Good, N.; Elliott, A. Ad hoc guesting: when exceptions are the rule. Usability, Psychology and Security (UPSEC 2008); 2008.

Hong, L.; Chi, E. H.; Budiu, R.; Pirolli, P. L.; Nelson, L. SparTag.us: a low cost tagging system for foraging of web content. Proceedings of 2008 International Working Conference on Advanced Visual Interfaces (AVI'08); 2008

Nelson, L.; Smetters, D. K.; Churchill, E. F. Looking through the keyhole: snippet sharing in close collaborations. Demonstration at 2008 ACM Conference on Computer Supported Cooperative Work (CSCW 2008), 2008.

Smetters, D. K.; Dalal, B.; Nelson, L.; Good, N.; Elliott, A. Ad-hoc guesting: when exceptions are the rule. ;login: the USENIX Magazine; 33 (4), 2008.

Churchill, E.F., Nelson, L.D., Smetters, D.K., Useful Computer Security, IEEE Internet Computing, v. 12(3), pp. 10-12, May-June 2008.

Nelson, L.D., Smetters, D., and Churchill, E. F. (2008): Keyholes: selective sharing in close collaboration. In: Proceedings of ACM CHI 2008, pp. 2443-2452, 2008.

Nelson, L. D.; Churchill, E. F.; Mapmail: Restructuring an Email Client for Use in Distributed Teams, Work-in-Progress Report, CHI '07 Extended Abstracts of Conference on Human Factors in Computing Systems (CHI 2007); April 2007.

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## DETAILED WORK PRODUCTS LIST

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### PUBLICATIONS (CONTINUED)

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Churchill, E. F.; Nelson, L. D., Interactive Community Bulletin Boards as Conversational Hubs and Sites for Playful Visual Repartee, Eighth Annual Workshop and Minitrack on Persistent Conversation, Hawai'i International Conference on Systems Science (HICSS), January 2007.

Churchill, E. F.; Nelson, L. D.; Hsieh, G. Café life in the digital age: augmenting information flow in a café-work-entertainment space, Experience Report, CHI '06 Extended Abstracts of Conference on Human Factors in Computing Systems (CHI 2006); 2006.

Nelson, L., Churchill, E.F., User Experience of Physical-Digital Object Systems: Implications for Representation and Infrastructure, Workshop Paper, Workshop on Smart Objects, The Seventh International Conference on Ubiquitous Computing, UBICOMP 2005, Tokyo, Japan, September 2005.

Churchill, E.F., Nelson, L., Sokoler, T., Tools that Tell Tales: Bridging Context Seams by Digitally Annotating Physical Artifacts Workshop Paper, Workshop on Smart Objects, The Seventh International Conference on Ubiquitous Computing, UBICOMP 2005, Tokyo, Japan, September 2005.

Bobrow, D., Cheslow, B., Churchill, E., Nelson, L., Whalen, J., Conversation Support in a Collaboration Space for a Distributed Workgroup, Workshop Paper, Workshop on Beyond Threaded Conversation, CHI 2005, Portland, OR, April 2, 2005.

Churchill, E.F., Nelson, L., Denoue, L., Helfman, J., and Murphy, P., Sharing Multimedia Content with Interactive Displays: A Case Study, ACM DIS 2004, Cambridge, 2004.

Carter, S., Churchill, E.F., Denoue, L., Helfman, J., and Nelson, L., Digital Graffiti: Public Annotation of Multimedia Content, Extended Abstracts of ACM CHI 2004, Vienna, Austria, April 24-29, 2004.

Nelson, L., Churchill, E.F., Denoue, L., Helfman, J., and Murphy, P., Goopy Interfaces: An Approach for Rapidly Repurposing Digital Content, Extended Abstracts of ACM CHI 2004, Vienna, Austria, April 24-29, 2004.

Churchill, E.F., Girgensohn, A., Nelson, L., Lee, A., Blending Digital and Physical Spaces for Ubiquitous Community Participation, Elizabeth Churchill, Communications of the ACM, February 2004, Vol. 47, No. 2, pp. 38-44.

Churchill, E.F., Nelson, L., Denoue, L., Murphy, P., and Helfman, J., THE PLASMA POSTER NETWORK Social Hypermedia on Public Display, Elizabeth Churchill, Les Nelson, Laurent Denoue, Paul Murphy, and Jonathan Helfman, In Public and Situated Displays. Social and Interactional Aspects of Shared Display Technologies. K. O'Hara, M.Perry, E. Churchill and D. Russell (Eds) London: Kluwer Academic Publishers.

Denoue, L., Nelson, L., and Churchill, E.F., A fast, interactive 3D paper-flier metaphor for digital bulletin boards, Proceedings of ACM UIST 2003.

Carter, S., Churchill, E.F., Denoue, L., Helfman, J., Murphy, P., and Nelson, L., Palimpsests on Public View: Annotating Community Content with Personal Devices, Scott Carter, Demonstration for UBICOMP 2003, Seattle, October 12-15th, 2003.

Churchill, E.F., Nelson, L., and Denoue, L., Multimedia Fliers: Informal Information Sharing With Digital Community Bulletin Boards, Elizabeth Churchill, Les Nelson, and Laurent Denoue, Communities and Technologies, Amsterdam, The Netherlands, September 2003.

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## DETAILED WORK PRODUCTS LIST

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### PUBLICATIONS (CONTINUED)

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Churchill, E.F., Nelson, L., Denoue, L., Girgensohn, A., The Plasma Poster Network: Posting Multimedia Content in Public Places, Human-Computer Interaction INTERACT '03, IOS Press, pp. 599-606, 2003.

Churchill, E.F., Girgensohn, A., Nelson, L., and Lee, A., Weaving Between Online and Offline Community Participation, Human-Computer Interaction INTERACT '03, IOS Press, pp. 729-732, 2003.

Denoue, L., Nelson, L., and Churchill, E.F., Implementing a paper flier metaphor using cloth simulation, Proceedings of SIGGRAPH 2003, 2003.

Churchill, E. F.; Nelson, L. D., From Media Spaces to Emplaced Media: Digital Poster Boards and Community Connectedness, Workshop on Media Space, ACM Conference on Computer Supported Cooperative Work, 2006.

Nelson, L. D.; Churchill, E. F. Mash Me Up, Mash Me Down: Restructuring Email for Content Sharing and Collaboration in Distributed Teams, Workshop on Mash-ups and CSCW, ACM Conference on Computer Supported Cooperative Work, 2006.

Nelson, L. D.; Churchill, E. F., Repurposing: Techniques for reuse and integration of interactive systems, Proceedings of the 2006 IEEE International Conference on Information Reuse and Integration, pp. 490-495, 2006.

Denoue, L., Nelson, L., and Churchill, E.F., AttrActive Windows: Dynamic Windows for Digital Bulletin Boards, Extended Abstracts of ACM CHI 2003, 2003.

Nelson, L., Denoue, L., and Churchill, E.F., AttrActive Windows: Active Windows for Pervasive Computing Applications, Proceedings of ACM Intelligent User Interface (IUI) 2003, Miami Beach, FL, pp 326, 2003.

Churchill, E.F., and Nelson, L., Tangibly Simple, Architecturally Complex: Evaluating a Tangible Presentation Aid, Extended Abstracts of ACM CHI2002, 2002.

Sokoler, T., Nelson, L., and Pederson, E.R., Low-Resolution Supplementary Tactile Cues for Navigational Assistance, In proceedings of Mobile HCI 2002. (Pisa, Italy, 2002), Springer-Verlag, Lecture notes in computer science #2411, pp. 369-372, 2002.

Nelson, L., Bly, S., and Sokoler, T., Quiet Calls: Talking Silently on Mobile Phones, , In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, pp. 174-181, ACM Press, March 31-April 5, 2001, Seattle, WA, 2001.

Pederson, E.R., Sokoler, T., and Nelson, L., Expanding a Tangible User Interface, , In proceedings of ACM DIS'2000, ACM Press, August 2000.

Churchill, E.F., Trevor, J., Bly, S., Nelson, L., and Cubranic, D., Anchored Conversations. Chatting in the Context of a Document, Proceedings of ACM CHI 2000, ACM Press, pp. 454-461, 2000.

Ichimura, S., Nelson, L., Pedersen, E.R., CardGear: A Presentation System Manipulated with Paper Cards, In Proc. of Interaction 2000 Symposium. Information Processing Society of Japan, pp. 17 - 24. (in Japanese), 2000.

Nelson, L., Ichimura, S., Pedersen, E.R., and Adams, L., Palette: A Paper Interface for Giving Presentations, Les Nelson, Satoshi Ichimura, In Proceeding of the CHI 99 Conference on Human Factors in Computing Systems, ACM Press, pp. 354-361, 1999.

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## DETAILED WORK PRODUCTS LIST

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### PUBLICATIONS (CONTINUED)

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Polak, W., Nelson, L., and Bickmore, T., Converting Information Management Systems to Relational Databases, Proceedings of the Software Technology Conference '95, April 1995.

Sherman, S., Nelson, L., Reuse Support for Ada Through Analysis of the Semantic Interface, Proceedings of First International Symposium on Environments and Tools for Ada, ACM, May 1990.  
Ada, ACM, May 1990.

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### TEACHING

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1982                      University of Wisconsin.                      Madison, Wisconsin  
*Lecturer*, Mathematical Programming Seminar, 1982, Developed instruction material and presented graduate seminar on Linear Programming.

1979 - 1982              University of Wisconsin.                      Madison, Wisconsin  
*Graduate Teaching Assistant*, Independently designed instructional material and gave undergraduate course in Introduction to Computer Programming.

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### PATENTS GRANTED

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Intellectual Property was developed for the Palo Alto Research Center, Inc. and the FX Palo Alto Laboratory, both affiliates of the Xerox Corporation.

6175954, Computer programming using tangible user interface where physical icons (phicons) indicate: beginning and end of statements and program constructs; statements generated with re-programmable phicons and stored

6195093, Systems and method for controlling a presentation using physical objects

6320496, Systems and methods providing tactile guidance using sensory supplementation

6509909, Systems and methods for controlling a presentation using physical objects

6580438, Systems and methods for maintaining uniformity in a presentation environment

6732915, Systems and methods for controlling a presentation using physical objects

6773177, Method and system for position-aware freeform printing within a position-sensed area

6823184, Personal digital assistant for generating conversation utterances to a remote listener in response to a quiet selection

6941342, Method for generating conversation utterances to a remote listener in response to a quiet selection

6992702, System for controlling video and motion picture cameras

7013279, Personal computer and scanner for generating conversation utterances to a remote listener in response to a quiet selection

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## DETAILED WORK PRODUCTS LIST

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### PATENTS GRANTED(CONTINUED)

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7089278, Anchored conversations: adhesive in-context virtual discussion forums  
7106852, Telephone accessory for generating conversation utterances to a remote listener in response to a quiet selection  
7249327, System and method for arranging manipulating and displaying objects in a graphical user interface  
7251316, Methods and systems for enabling conversations about task-centric physical objects  
7272563, Personal computer and scanner for generating conversation utterances to a remote listener in response to a quiet selection  
7286649, Telecommunications infrastructure for generating conversation utterances to a remote listener in response to a quiet selection  
7519573, System and method for clipping repurposing and augmenting document content  
7546143, Multi-channel quiet calls  
7577916, Method and apparatus for management and representation of dynamic context  
7610563, System and method for controlling the display of non-uniform graphical objects  
7823070, Methods and systems for extending existing user interfaces  
7836409, Systems and methods for using interaction information to deform representations of digital content  
7933889, Method and system for metadata-driven document management and access control  
8131762, Method and system for metadata-driven document management and access control  
8504626, System and method for content tagging and distribution through email  
8612845, Method and apparatus for facilitating directed reading of document portions based on information-sharing relevance  
8666979, Recommending interesting content using messages containing URLs  
8966362, Method and system for in-document markup in support of information sharing  
9137190, System and method for content-based message distribution  
9613079, System and method for providing a synchronized data rerepresentation  
9672482, System and method for automatic objective reporting via wearable sensors  
9898789, Method and a system for providing hosted services based on a generalized model of a health/wellness program  
10235019, Computer-implemented system and method for providing a data rerepresentation



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## DETAILED WORK PRODUCTS LIST

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### TECHNICAL REPORTS

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#### Selected Lockheed Technical Reports in Software Engineering delivered to Customers

Nelson, L., (first author), Lockheed Software Reengineering Process, Lockheed Missiles and Space Company, 1994

Nelson, L., (first author), Telstar Systems Software Development Process, 1992

Nelson, L., (co-author), Telstar Systems System Engineering Process, 1992

Nelson, L., (co-author), Telstar Systems Unit and Acceptance Test Process, 1992