

Trevor J. Smedley

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Citizenship: Canadian and British. US Permanent Resident

Education

2006-2009 L.L.B. Dalhousie University, Canada, Bachelor of Laws (equivalent to US J.D.)

1987-1990 Ph.D. University of Waterloo, Canada, Doctorate (Computer Science)

1985-1987 M.Math. University of Waterloo, Canada, Master of Mathematics (Computer Science)

1984-1985 Universität Karlsruhe, Germany, Visiting Research Student (Computer Science)

1981-1984 B.Math. University of Waterloo, Canada, Bachelor of Mathematics (Co-Op, Joint Honors in Pure Math & Computer Science)

Bar Admission

Massachusetts, 2010 - present

Experience

I have been programming computers for nearly 50 years, since 1974, ranging from hand-assembling machine code as part of a middle school science fair project, to logic programming in Prolog for natural language processing. I spent 20 years as a professor in Computer Science, teaching undergraduate and graduate courses with a focus on software development and user interfaces. I have also spent over 20 years working as an expert witness and consultant, with more than 10 years of that as my primary employment. Additionally, I graduated from law school in 2009 and am a member of the Massachusetts bar. In 2008 I worked as a summer associate, working primarily on patent litigation. More recently I have become involved in embedded systems, working with software and hardware on a variety small-scale projects that I am working towards developing into commercial products.

Expert Witness and Consultant, 1999 – present

- Most of my expert work has been in patent litigation cases, with additional experience in IPR and trade secret litigation.
- The cases have involved a wide range of technologies, including: visual programming languages; virtual instrumentation; 3d graphics; video games; user interfaces; spreadsheets; medical equipment; cellular phones and base stations; wired and wireless networking; image processing; software as a service; open source licensing; information processing; mobile user interfaces; terminal emulation; automotive technologies; web technologies including search, shopping, dating advertising, video conferencing, etc.; digital rights management; graphics processing units; flash memory; and pop-up advertising.
- I have performed investigation and analysis of source code and other documents, and written numerous reports and declarations with respect to both infringement and validity, as well as for IPR and trade secret proceedings.
- Worked with attorneys from many law firms, including: McKool Smith; Fish & Richardson; Howrey; Borden, Ladner, Gervais; Banner & Witcoff; Burchells; Carlson Caspers; Schwegman, Lundberg, Woessner; Oblon Spivak; Vinson & Elkins; Bunsow De Mory; Liner; Blakely, Sokoloff, Taylor & Zafman; Orrick, Herrington & Sutcliffe; Mishcon de Reya; Ahmad Zavitsanos Anaipakos Alavi &

Mensing; Gray Reed; Cunningham Swaim; Heim, Payne & Chorush; Nelson Bumgardner; Baker Botts; Dentons; Susman Godfrey; Hosie Rice; Durie Tangri.

- I have more than 20 years' experience in source code analysis for patent litigation, including a wide range of programming languages for both software and hardware.
- More than 10 years' experience in source code analysis for wired and wireless communications, including ADSL, VDSL, Bluetooth, WiFi, WiMAX, CDMA, WCDMA, GSM, OFDMA, LTE and 5G.
- In the last five years I have testified at trial in the following four cases:
 - *Arendi S.A.R.L. v. Google LLC*, 1:13-cv-00919 (D.Del.) (2023) Testified as the plaintiff's infringement expert for a patent relating to searching and acting on information in a document while it is being edited.
 - *ContentGuard Holdings v. Amazon.com*, 2:13-cv-01112 (E.D. Tex.) (2015) My testimony was regarding my examination of the source code relating to DRM protection. (On behalf of ContentGuard.)
 - *Core Wireless Licensing S.A.R.L v. Apple, Inc.*, 6:12-CV-100 (E.D. Tex.) (2015). My testimony was regarding my examination of the source code for various cellular devices. (On behalf of Core Wireless.)
 - *Wi-LAN, Inc. v. Apple Inc. et. al.*, 6:11-cv-453 (E.D. Tex.) (2013). My testimony was regarding my examination of the source code for various cellular devices. (On behalf of Wi-LAN.)
- In the last five years I have been deposed in the following matters (several matters involved multiple depositions):
 - *Regents of the University of Minnesota v. AT&T Mobility LLC* D.Minn. 0:14-cv-04666 (2023) Deposed regarding my source code analysis declaration. (On behalf of UMN)
 - *MasterObjects, Inc. v. Meta Platforms, Inc.* N.D. Cal. 3:21-cv-05428 (2022) Deposed regarding my source code analysis declaration (On behalf of MasterObjects).
 - *MasterObjects, Inc. v. Amazon.com, Inc.* N.D. Cal 3:20-cv-08103 (2022) Deposed regarding my source code analysis declaration (On behalf of MasterObjects).
 - *Arendi S.A.R.L. v. Google LLC* D.Del. 1:13-cv-00919; *Arendi S.A.R.L. v. Motorola Mobility LLC* D.Del. 1:12-cv-01601; *Arendi S.A.R.L. v. Oath Holdings Inc. et al.* D.Del. 1:13-cv-00920 (2021). My testimony was regarding my expert reports on infringement (On behalf of Arendi).
 - Match Group IPR2019-1000 (2020) My testimony was regarding my validity declaration in support of the Patent Owner's Response for a patent relating to online dating apps.
 - *Data Engine Technologies LLC v Google Inc.*, 1:14-cv-01115 (D. Del.) (2020) My testimony was regarding my expert report on validity. (On behalf of Data Engine Technologies.)
 - Match Group IPR2019-842 (2020) My testimony was regarding my validity declaration in support of the Patent Owner's Response for a patent relating to online dating apps.
 - *Fidelity Information Services, LLC v. Groove Digital Inc*, IPR2019-00050, IPR2019-0019 (2019). My testimony was regarding my opinion as to the validity of US Patent 9,454,762 relating to the display of advertising information via a network. (On behalf of Groove Digital).
 - *Apple Inc. v. Wi-LAN Inc., et al*, 3:14-cv-02235 (2018). My testimony was regarding my examination of the source code for various cellular devices. (On behalf of Wi-LAN.)
- In the last five years I have worked for the following clients in relation to legal matters. I provide case numbers (including all numbers for cases that were consolidated) and indicated when the consultancy was pre-litigation (so no case number is appropriate). For clients for whom I have consulted on multiple matters, the cases are grouped by matter. Consulting work that was not related to legal matters is listed separately.

- Direct Media LLC – Engaged by the patent holder in an IPR for a patent related to creation, distribution and tracking of online advertisements. (2023 – current)
- – Engaged as behalf of the defendant in an arbitration with respect to patent infringement for patents related to security of telephone transactions. This included providing a live, in-person technology tutorial for the arbitrator (2022 – current).
- Zoom Communication, Inc – Patents relating to end-to-end encryption in video conferencing. (2022 – current. *Cyph, Inc. v. Zoom Communication, Inc.* 4:22-cv-00561 N.D. Cal. filed: 01/28/2022)
- University of Minnesota – Infringement analysis and source code review for patents relating to cellular data communications using LTE and 5G. (2021 – current. *Regents of the University of Minnesota v. AT&T Mobility LLC* 0:14-cv-04666 D.Minn. filed 11/05/2014)
- Nikon – Source code review and report in support of non-infringement of patents relating to wireless transfer of images between a mobile device and a digital camera. (2021-2022. *Cellspin Soft, Inc. v. Nikon Americas, Inc. and Nikon, Inc.*, N.D. Cal. 4:17-cv-05936 filed: 10/16/2017)
- MasterObjects, Inc. – Infringement analysis and source code review for patents relating to typeahead search technology. (2020 – 2022. *MasterObjects, Inc. v. Meta Platforms, Inc.* W. D. Tex. 6:20-cv-00087 filed 02/05/2020, transferred to N.D. Cal. 3:21-cv-05428, 07/13/2021; *MasterObjects, Inc. v. Amazon.com, Inc.* S.D.N.Y. 1:20-cv-03478 filed: 05/04/2020, transferred to N.D. Cal 3:20-cv-08103, 10/15/2020)
- Arendi S.A.R.L. –Code review and infringement analysis for patent relating to searching and acting on information in a document while it is being edited. Testified at trial as infringement expert in Google case. (2020 – 2023. *Arendi S.A.R.L. v. Google LLC* D.Del. 1:13-cv-00919 filed 05/22/2013; *Arendi S.A.R.L. v. Motorola Mobility LLC* D.Del. 1:12-cv-01601 filed 11/29/2012; *Arendi S.A.R.L. v. Oath Holdings Inc. et al.* D.Del. 1:13-cv-00920 filed 05/22/2013; *Arendi S.A.R.L. v. HTC Corp., et al.* D.Del. 1:12-cv-01600 filed 11/29/2012)
- Match Group – IPR petitions for Patents relating to user interface techniques for online dating systems. (2019 – 2020. IPR2019-842, IPR2019-1000, IPR2019-1537, IPR2019-1538)
- Data Engine Technologies – Patents relating to spreadsheet interfaces. (2015-2016, 2019-2020). *Data Engine Technologies LLC v Google Inc.*, 1:14-cv-01115 (D. Del., filed 09/02/2014), *Data Engine Technologies LLC v. International Business Machines Corp.* 6:13-cv-00859 (E.D. Tex, filed 11/04/2013)).
- Groove Digital – IPR petitions for Patent relating to the display of advertising information via a network. (2019. *Fidelity Information Services, LLC v. Groove Digital Inc*, IPR2019-00050, IPR2019-00193).
- Expedia – Patents relating to Single Sign On functionality. (2018 - 2019. *Int’l Business Machines Corp. v. Expedia, Inc. et al.*, 1:17-cv-01875-LPS D.Del, filed 12/29/2017, IPR2019-00404, IPR2018-01685)
- Wi-LAN Inc. – Various aspects of wired and wireless communications, including multiple access between transceivers in wireless communications networks, adaptive frequency hopping, signaling data between mobile phones and cell sites, cellular data communications; mobile device user input methods. Technologies included Bluetooth, WiFi, WiMAX, CDMA, WCDMA, GSM and LTE.
 - Nov 2017 – Dec 2019
 - *Wi-LAN, Inc. et al v. LG Electronics, Inc. et al*, 3:17-cv-00358 (SD CA, filed 02/22/2017), *Wi-LAN, Inc. et al v. Lenovo Group, LTD. et al*, 3:17-cv-00365 (SD CA, filed 02/23/2017)).
 - *WI-LAN Inc. et al v. LG Electronics, Inc. et al*, 3:18-cv-1577 (SD CA, filed 07/11/2018)

- May 2017 – July 2018
 - *Wi-LAN, Inc. v. Apple Inc.*, 3:14-cv-01507 (SD CA filed: 06/23/2014)
 - *Apple Inc. v. Wi-LAN Inc., et al.*, 3:14-cv-02235 (SD CA, filed: 09/19/2014)
- Network Managing Solutions – Patents relating to base station functionality for fault monitoring and data collection. (2018. *Network Managing Solutions, LLC v. AT&T Mobility, Network Managing Solutions, LLC v. Sprint Corp. and Sprint Spectrum, Network Managing Solutions, LLC v. T-Mobile USA, Inc., Network Managing Solutions, LLC v. United States Cellular Corporation, Network Managing Solutions, LLC v. Verizon Wireless*, 1:16-00295 – 299. D Del filed 4/25/2016)
- PanOptis – Patents relating to wireless communications. (2017-2018) *Optis Wireless Technology, LLC et al. v. Huawei Technologies Co. Ltd. et al.*, 2:17-cv-123 (E.D. Tex filed 04/14/17)
- Visual Effects Innovations – I provided a declaration relating to claim construction of claims relating to software. (2017-2018. *Visual Effect Innovations, LLC v. NVIDIA Corporation*, 3:17-cv-03187 (ND Cal filed: 06/05/2017))

Summer Associate, Fish & Richardson P.C., May – August 2008, Boston, MA

- Worked in Litigation Practice Group
- Performed range of tasks, including: writing briefs on complex issues (e.g. obviousness under KSR), researching and evaluating prior art, drafting discovery motions, drafting claim charts respecting infringement.

University Professor, 1989 – 2009

Dalhousie University, Faculty of Computer Science, Halifax, Nova Scotia, Canada

Full Professor: 2005-2009; Associate Professor: 1996-2005; Assistant Professor: 1991-1996; Adjunct Professor: 2009-2012

University of Delaware, Department of Computer and Information Science, Newark, DE

Visiting Assistant Professor: 1989-1991

- Taught both graduate and undergraduate courses, covering a wide range of topics, including Digital Media, User Interface Design, End-User Programming, Programming Languages, Software Engineering, Web Design and Development.
- Received research grants from various organizations, including: NSERC, InnovaCorp, the British Consulate and the Dalhousie University Faculty of Computer Science.
- Published over 40 papers, supervised over a dozen graduate students (both Master's and Ph.D.), presented research at numerous conferences, participated in the organization of conferences and workshops, edited academic journals, and served in a range of other academic roles.

Software and User Interface consulting, 1992 – 2012

- Provided consultant services to a variety of companies from 1994 to 2012, including software and user interface design and development, and website development and support.
 - Agora Mobile Inc. – Software and user interface design and development, and website development and support, related to application development frameworks for mobile devices. (2009-2012).
 - Scientific Metrics – Software and user interface design and development, and website development and support, related to a multi-user decision-making tool (2004-2007).
 - Pictorius Inc. (1992-1999) – Software and user interface design and development related to a software development tool based on a graphical programming language.
 - Paradata Inc (1997) – Software and user interface design and development related to a GIS system.

- Tendrel Technologies (1994) – Software and user interface design and development related to a multimedia development system.

Legal Researcher, Legal Research Council, Halifax, Nova Scotia, 2009

- Did legal research on a wide range of general and business practice issues, on a part-time, contract basis.

Awards (Law School)

- Law Foundation of Nova Scotia Scholarship 2006 (\$5000) Entrance scholarship (approximately four awarded per year).
- Boyne Clarke Prize 2007 (\$1000) Best first-year student from Nova Scotia.
- G.O. Forsyth Essay Prize 2007 (\$350 — \$700 prize, shared with another student) Best essay.
- Trilateral Moot Court Competition 2008 (non-monetary awards) Best overall team, best factum.
- Gowlings Law and Technology Prize 2009 (\$500) Highest mark in Law and Technology.

Publications

Trevor J. Smedley and Ross A. Dannenberg. Building a Better Mousetrap: If It's Virtual, Can Its Patent Be Infringed? *Landslide*. March/April 2011.

Trevor J. Smedley and Ross A. Dannenberg. Enforceability of Machine Patents in Virtual Worlds. *Journal of Internet Law*, January 2010.

Trevor J. Smedley. Demystifying Technology for the Technology Lawyer: Hardware and Software. Web conference prepared and delivered for IT.Can, June 2007.

Marcel Karam, Trevor Smedley and Sergiu Dascalus, Unit Level Test Adequacy Criteria for Visual Dataflow Languages and a Testing Methodology. *ACM Transactions on Software Engineering and Methodology*. Sept 2008, 1 - 40.

Anthony Cox and Trevor Smedley, Reverse engineering in support of litigation: Experiences in an adversarial environment, In proceedings, Working Conference on Reverse Engineering, Benevento, Italy, 2006, 288 - 290

Ken Dwyer and Trevor Smedley. A mobile, visual scripting environment for monitoring and controlling wireless devices. In proceedings, IEEE International Conference on Wireless and Mobile Computing, Networking and Communications, 2005. 151 - 158.

Simon Gauvin and Trevor Smedley. Reduction of Cognitive Load Through the Addition of High-Level Semantics to ReactoGraph. In Proceedings, IEEE Symposium on Visual Languages and Human-Centric Computing. 2004. 181- 188.

Yael Kollet and Trevor J. Smedley. Message-Flow Programming in PdaGraph. In Proceedings, IEEE Symposium on Visual Languages and Human-Centric Computing. 2004. 229- 232.

Anthony Cox, Simon Gauvin and Trevor Smedley. Towards Comprehensible Control Flow in Visual Data Flow Languages. In Proceedings, International Workshop on Visual Languages and Computing. 2004. 247-252.

Shea Armstrong, Yael Kollet and Trevor J. Smedley. PDAGraph: Event-Driven, Visual Scripting for Handheld Computers. In Proceedings, International Workshop on Visual Languages and Computing. 2004. 235-240.

Marcel R. Karam and Trevor J. Smedley. Visualizing Intra-procedural Data-flow Interactions to Help Locate Faults. In Proceedings, International Workshop on Visual Languages and Computing. 2004. 241-246

Marcel R. Karam and Trevor J. Smedley. Visualizing the Testedness of Data-flow Interactions in Imperative Functions, In Proceedings, Software Engineering Research and Practice. 2004, 297-306.

Shapour Arjomandy and Trevor J. Smedley. Visual specification of behaviours in VRML worlds. In Proceedings, Ninth International Conference on 3D Web Technology, 2004. 127 - 133.

Marcel R. Karam and Trevor J. Smedley. An Abstract Graph Model to Collect Interprocedural Dataflows in Visual Dataflow Programs, In Proceedings, Software Engineering Research and Practice. 2003, 503-508

Simon Gauvin and Trevor Smedley. Component Framework for Visual Programming Language Design, In Proceedings, Software Engineering Research and Practice. 2003, 497-502

Marcel R. Karam and Trevor J. Smedley. Interprocedural Data-flow Testing for Visual Dataflow Languages. In Proceedings, International Conference on Intelligent and Adaptive Systems and Software Engineering. 2003 196-201

Simon Gauvin and Trevor Smedley. Vivid: A Framework for Creating Visual Programming Languages. In Proceedings, International Conference on Intelligent and Adaptive Systems and Software Engineering. 2003 223-226

Shea Armstrong, Yael Kollet, Trevor J. Smedley, Visual Scripting for Handheld Computers. In Proceedings, IEEE Symposium on Human-Centric Computing: End-User Programming, Washington (2002) 68-70

Simon Gauvin and Trevor Smedley, Concrete Programming with Reactive Objects. In Proceedings, IEEE Symposium on Human-Centric Computing: End-User Programming, Washington (2002) 74-76

Marcel R. Karam and Trevor J. Smedley, A Data-flow Testing Methodology for a Dataflow Based Visual Programming Language. In Proceedings, IEEE Symposium on Human-Centric Computing: End-User Programming, Washington (2002) 86-89

P.T. Cox, T. Smedley, Experiences with Visual Programming Languages for End-Users and Specific Domains, Proc. OOPSLA Workshop on Domain-Specific Visual Languages. Tampa Bay, FL (October 2001), 87-96.

M. R. Karam and T. J. Smedley. A Testing Methodology for a Dataflow Based Visual Programming Language. Proceedings of 2001 IEEE Symposium on Human-Centric Computing Languages and Environments (Sept 2001) 280-287

Philip T. Cox, Trevor J. Smedley. Guest Editors' Introduction: Special Issue on Visual Languages for End-user and Domain-specific Programming. Journal of Visual Languages and Computing 12 (5): 473-474 (2001)

P.T. Cox, T. Smedley, A Formal Model for Parametrised Solids in a Visual Design Language, Journal of Visual Languages and Computing, 11 (6), Academic Press (2000), 687-710.

P.T. Cox, T. Smedley, Building Environments for Visual Programming of Robots by Demonstration, Journal of Visual Languages and Computing 11(5), Academic Press (2000), 549-571.

Trevor J. Smedley, David W. McIntyre. Guest Editors' Introduction: Selected Papers from VL'98. Journal of Visual Languages and Computing 11 (5): 479-480 (2000)

P.T. Cox, T.J. Smedley. LSD: A logic-based visual language for designing structured objects. Journal of Visual Languages and Computing. 9(5) pp. 509-534, 1998.

P.T. Cox, C. Risley, and T.J. Smedley. Toward concrete representation in visual languages for robot control. Journal of Visual Languages and Computing. 9(2) pp. 211-239, 1998.

C.C. Risley, T.J. Smedley. Visualization of compile time errors in a Java compatible visual language. Proc. of 1998 Symposium on Visual Languages. 22-29. Halifax, Canada (Sept. 1998).

P.T. Cox, T.J. Smedley. A model for object representation and manipulation in a visual design language. Proc. of 1998 Symposium on Visual Languages. 254-261. Halifax, Canada (Sept. 1998).

P.T. Cox, T.J. Smedley. Visual programming for robot control. Proc. of 1998 Symposium on Visual Languages. 217-224. Halifax, Canada (Sept. 1998).

- A.M. Winn, T.J. Smedley. Multimedia Workshop: Exploring the benefits of a visual scripting language. Proc. of 1998 Symposium on Visual Languages. 280-287. Halifax, Canada (Sept. 1998).
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- P.T. Cox, T.J. Smedley, J. Garden, and M. McManus. Experiences with visual programming in a specific domain — visual language challenge '96. In Proceedings of the 1997 IEEE Symposium on Visual Languages. 254-259. Capri, Italy, September 1997.
- P.T. Cox and T.J. Smedley. A declarative language for the design of structures. In Proceedings of the 1997 IEEE Symposium on Visual Languages. 438-445. Capri, Italy, September 1997.
- A. Rau-Chaplin and T.J. Smedley. A graphical language for generating architectural forms. In Proceedings of the 1997 IEEE Symposium on Visual Languages. 260-267. Capri, Italy, September 1997.
- Allen L. Ambler, Thomas Green, Takayuki Dan Kumura, Alexander Repenning, Trevor J. Smedley. 1997 Visual Programming Challenge Summary. In Proceedings of the 1997 IEEE Symposium on Visual Languages. 11-18. Capri, Italy, September 1997.
- P.T. Cox and T.J. Smedley. A visual language for the design of structured graphical objects. In Proceedings of the 1996 IEEE Symposium on Visual Languages. 296-303. Boulder, Colorado, September 1996.
- T.J. Smedley. P.T. Cox, and S.L. Byrne. Expanding the utility of spreadsheets through the integration of visual programming and user interface objects. Advanced Visual Interfaces '96. 148-155. Gubbio, Italy, May 1996.
- T.J. Smedley. A high-level visual language for the graphical description of digital circuits. In Proceedings of the 1995 IEEE Symposium on Visual Languages. 77-82. Darmstadt, Germany. September 1995.
- H. Glaser and T.J. Smedley. P sh — The next generation of command line interfaces. In Proceedings of the 1995 IEEE Symposium on Visual Languages. 29-36. Darmstadt, Germany. September 1995.
- P.T. Cox and T.J. Smedley. Using visual programming to extend the power of spreadsheet computation. In Proceedings Advanced Visual Interfaces '94. 153-161. Bari, Italy. June 1994.
- T.J. Smedley and A.J. Jost. Graphical parametrised structural descriptions of VLSI devices. In Proceedings of the 1993 IEEE Workshop on Visual Languages. 282-286. Bergen, Norway. August 1993.
- T.J. Smedley. Using pictorial and object oriented programming for computer algebra. In Proceedings of the Symposium on Applied Computing '92. 1243-1247. Kansas City, MO, USA. March 1992.
- Trevor J. Smedley. Detecting Algebraic Dependencies Between Unnested Radicals. ISSAC 1990: 292-293
- Trevor J. Smedley. A new Modular Algorithm for Computation of Algebraic Number Polynomial Gcds. ISSAC 1989: 91-94
- Keith O. Geddes, Gaston H. Gonnet, Trevor J. Smedley. Heuristic Methods for Operations with Algebraic Numbers. ISSAC 1988: 475-480
- Trevor J. Smedley. Radical simplification using algebraic extension fields. EUROCAL 1987: 313-314
- Trevor J. Smedley. Integration of Rational Functions in SAC-2. AAECC 1985: 373-384