Chris Lilley CV

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Summary

I'm a Technical Director at the World Wide Web Consortium (W3C), with specific involvement in **Web Fonts, CSS,** and **Web Audio**. I am a **co-author of PNG** and played a pivotal rôle in the **creation of SVG**, the development of **CSS @font-face** and the worldwide success of **downloadable fonts** with WOFF 1.0 and 2.0, for which I was a recipient of a **Technical Emmy** at the 73rd Tech Emmy awards in 2022.

I'm the W3C representative to the International Color Consortium (ICC). Earlier, I was a member of the **W3C Technical Architecture Group** and co-author of *Architecture of the World Wide Web, volume 1* with ***Tim Berners-Lee***, ***Roy Fielding***, and others. I was the first chair of the **Fonts, CSS**, and **SVG Working Groups** at W3C, and co-editor of the CSS2 and SVG 1 specifications. I am currently editor, or co-editor, of **fourteen W3C specifications**. I'm co-author of **six books** in the field of Computer Graphics, and have given **over 85 talks** at conferences worldwide.

Work experience

Jul 2008 - present	Technical Director, W3C Overall technical direction of interactive, user-facing Web standards. W3C Strategy Team, Core Web Design.
Jul 2006 - Jul 2008	Domain Lead, Interaction Domain, W3C Managerial responsibility of Interaction Domain staff.
Aug 2006 - Feb 2010	Rich Web Client Activity Lead, W3C The first attempt to integrate multiple languages such as HTML, SVG, MathML, XForms and custom markup. Namespace-based approach, eventually closed down in favour of HTML5.
Apr 1996 - Dec 2014	Graphics Activity Lead, W3C Overall responsibility for Web graphics standards - notably PNG, WebCGM, SVG.
Apr 1996 - Dec 2014	Fonts Activity Lead, W3C Creation of the @font-face specification for load-on-demand fonts (later merged into CSS2, SVG1 and CSS Fonts 3), then responsibility for the downloadable font formats WOFF 1.0 and WOFF 2.0.
Mar 1995 - Mar 1996	W3C Advisory Committee representative, JISC Representing the digital, networked needs of the UK Higher Education sector to the W3C.
Apr 1991 - Mar 1996	Technical Author & Electronic Teaching Specialist, University of Manchester, UK Responsible for the research, writing, illustration and field-testing of training materials on Computer Graphics, used throughout the UK Higher Education sector.
Apr 1986 - Sep 1989	Medical Laboratory Scientific Officer, Departments of Haematology and Transfusion Science, Falkirk Infirmary. Diagnostic blood testing, transfusion cross-matching, emergency on-call coverage, computer analysis of diagnostic data.

Awards

In 2021 I was nominated for a **Technology and Engineering EMMY® award** for my work on Web Fonts, which started in 1996 with a requirements document and continued through the creation of the CSS @font-face (1998) and the development of the WOFF 1 (2012) and WOFF 2 (2018) downloadable font formats. Taken as a set of technologies, this resulted in global deployment of downloadable Web fonts moving from 0% (2010 and earlier) to 87% of the top 10 million web sites (2024).

In April 2022 I was honoured to **accept this Technical Emmy award** on behalf of the W3C WebFonts Working Group, for *Standardization of Font Technology for Custom Downloadable Fonts and Typography for Web and TV Devices*.

Speaking

I have given **over 80 talks in twenty countries** over the last 25 years, and have spoken at some of the **most prominent international** web development conferences, including giving **opening keynote addresses**. Recent topics have included:

- Colour gamut mapping in CIE Lab and Oklab
- Colour on the web and broadcast
- OpenType features in CSS Fonts
- Chromatic font extensions to OpenType
- WOFF 2.0 and WebFonts
- ICC Color Management in SVG & CSS
- New features in SVG2
- New work at W3C - WebAssembly, WebVR&AR

A full list of talks is available, with links to slides, video, and papers as appropriate.

Judging & reviewing

I have served on the **program committees** for:

- the *International World Wide Web* conferences
- the *SVG Open* conference series
- the *International Unicode* conferences
- *Extreme Markup (now Balisage)*.

I was the **technical reviewer** for Chris Coyier's book *Practical SVG* (2016, ISBN: 978-1-952616-36-5), published by *A Book Apart*.

Publications

Books

- Lilley, C. *Color on the Web*. Chapter 16 in Green, P. (editor) (2024) *Fundamentals and Applications of Colour Engineering*. Wiley. ISBN 978-1119827184
- Watt, Andrew H.; Lilley, Chris, *et. al.* (2003) SVG Unleashed. Sams. ISBN 0-672-32429-6
- Lin, F.; Wyrwas, K.; Irwin J.; Lilley, C.; Hewitt, W.T.; Howard, T.L.J. (1995) Geometry for Computer Graphics. Sheffield, UCoSDA. ISBN 1-85889-059-4
- Lilley, C.; Lin, F.; Hewitt, W.T.; Howard, T.L.J. (1993) Visualisation 1: Graphical Communication. Sheffield, UCoSDA. ISBN 1-85889-027-6
- Lilley, C.; Lin, F.; Hewitt, W.T.; Howard, T.L.J. (1993) Colour in Computer Graphics. Sheffield, UCoSDA. ISBN 1-85889-022-5
- Lilley, C.; Lin, F.; Hewitt, W.T.; Howard, T.L.J. (1993) Standards for Computer Graphics. Sheffield, UCoSDA. ISBN 1-85889-017-9

Papers

- Lilley, C. *Towards an HDR-capable ICC PCS*. Expert contribution to the International Color Consortium (ICC), June 2020. HTML | PDF.
- Lilley, C. *Ask an expert: Why is CSS . . . the way it is?*. In *Increment magazine* Issue 13, May 2020. HTML | PDF.
- Everson, M; Lilley, C. (2019) *Proposal for the addition of four Latin characters to the UCS*. ISO/IEC JTC1/SC2/WG2 N5044. PDF.
- Everson, M; Jacquerye, D; Lilley, C. (2012) *Proposal for the addition of ten Latin characters to the UCS* ISO/IEC JTC1/SC2/WG2 N4297. PDF
- Lilley, C.; Correll, S. (2003) *Extending SVG Fonts with Graphite*. In *Proceedings of the 23rd International Unicode Conference* PDF.
- Lilley, C. (2001) *SVG: Unicode meets Vector Graphics*. In *Proceedings of the 18th International Unicode Conference*.

- Lilley, C. (2000) *Scalable Vector Graphics*. In *Proceedings of the Ninth International World Wide Web Conference* PDF.
- Lilley, C. (2000) *Internationalisation and Localisation with SVG* in *Proceedings of the 16th International Unicode Conference*.
- Lilley, C. (1998) *Rendering Multilingual Documents – CSS and XSL* in *Proceedings of the 13th International Unicode Conference*. PDF.
- Nielsen, Henrik Frystyk; Gettys, Jim; Baird-Smith, Anselm; Prud'hommeaux, Eric; Lie, Håkon Wium; Lilley, Chris (1997) *Network Performance Effects of HTTP/1.1, CSS1, and PNG* in *ACM SIGCOMM Computer Communication Review* **27(4)**, pp.155-166 ·October 1997 HTML.
- Lilley, C. (1997) *The Design of an International Web Font Extension for Cacading Style Sheets* in *Proceedings of the 11th International Unicode Conference*. PDF.
- Lilley, C (1995) *Not Just Decoration : Quality Graphics for the Web*. in *World Wide Web Journal* **1(1)**, pp.291–307, Boston, 1995. HTML.
- Lilley, C. (1995) *Active Web Pages*. In *Proceedings of the 1995 Eurographics UK Conference*, Loughborough, 1995, pp 267–281
- Lilley, C; Lin, F; Hewitt, W.T.; Howard, T.L.J. (1994) *The Design and Development of Distance Learning Materials for Graphics and Visualisation*. In *Eurographics Workshop on Graphics and Visualisation Education (GVE)*, Barcelona, 1993. Also reprinted in *Computers & Graphics* **18(3)**, pp.269–275. PDF
- Lilley, C. (1994) *An Introduction to Standardised Colour Measurement*. in *Proceedings of the 12th Eurographics UK Conference*, 22–24 March 1994 pp.163–177

Web Standards and other specifications

Technical reports, which are frequently revised, have a date range: date of first publication, and date of most recent publication.

- Lilley, Chris (editor) (2024) *CSS Color HDR Module Level 1*. W3C First Public Working Draft, 17 December 2024
- Baron, David L.; Etemad, Elika J.; Lilley, Chris; Suzanne, Miriam E. (editors) (2021-2024) *CSS Conditional Rules Module Level 5*. W3C Working Draft, 5 November 2024
- Birtles, Brian; Jackson, Dean; Atkins, Tab; Lilley, Chris (editors)(2024) *CSS Easing Functions Level 2*. W3C Working Draft, 29 August 2024
- Baron, David L.; Etemad, Elika J.; Lilley, Chris (editors)(2024) *CSS Conditional Rules Module Level 3*. W3C Candidate Recommendation, 15 August 2024
- Blume, C et. al. (editors)(2022-2024) *Portable Network Graphics (PNG) Specification (Third Edition)*. W3C Candidate Recommendation, 18 July 2024
- Lilley, Chris; Rieger, Garret; Iterum, Skef (editors) (2021-2024) *Incremental Font Transfer*. W3C Working Draft, 9 July 2024
- Lilley, Chris; Kravets, Una; Verou, Lea; Argyle, Adam (editors) (2020-2024) *CSS Color Module Level 5*. W3C Working Draft, 29 February 2024
- Atkins, Tab; Lilley, Chris (editors) (2016-2024) *CSS Color Module Level 4*. W3C Candidate Recommendation, 13 February 2024
- Lilley, Chris (editor) (2021-2024) *CSS Fonts Module Level 5*. W3C Working Draft, 6 February 2024
- Lilley, Chris (editor) (2017-2024) *CSS Fonts Module Level 4*. W3C Working Draft, 1 February 2024
- Atkins, Tab; Etemad, Elika J.; Rivoal, Florian; Lilley, Chris (2023) *CSS Snapshot 2023*. W3C Group Note, 7 December 2023
- Lilley, Chris (1996-2022) *Fonts for the Web: Rationale, 1996* W3C Group Note, 14 April 2022
- Baron, David L.; Etemad, Elika J.; Lilley, Chris (editors) (2020-2022) *CSS Conditional Rules Module Level 4*. W3C Candidate Recommendation, 17 February 2022
- Çelik, Tantek; Lilley, Chris; Baron, L. David (editors) (2001-2022) *CSS Color Module Level 3*. W3C Recommendation, 18 January 2022
- Lilley, Chris (editor) (2020) *Progressive Font Enrichment: Evaluation Report*. W3C Working Group Note, 15 October 2020
- Daggett, John; Maxfield, Myles; Lilley, Chris (editors) (2011-2018) *CSS Fonts Module Level 3*. W3C Recommendation, 20 September 2018.
- Lilley, Chris (editor) (2017) *RFC 8081: The font Top Level Type*. IETF Proposed Standard, February 2017.
- Lilley, Chris (editor) (2014-2016) *WOFF 2.0 Evaluation Report*. W3C Group Note, 15 March 2016
- Thompson, H.; Lilley, C. (2004-2014) *RFC 7303: XML Media Types*. IETF Proposed Standard. 07 July 2014.
- Dahlström, Eric *et. al.* (2001-2011) *Scalable Vector Graphics (SVG) 1.1 (Second Edition)*. W3C Recommendation. 16 August 2011.
- Lilley, Chris; Grasso, Anthony (2009) *SVG Color 1.2, Part 2: Language.* W3C specification, 01 October 2009.
- Anderson, A.; Berjon, R. *et. al.* (2003-2006) *Scalable Vector Graphics (SVG) Tiny 1.2 Specification*. W3C Recommendation, 22 December 2008.

- Jacobs, Ian; Walsh, Norm (eds)(2002-2004) *Architecture of the World Wide Web, Volume One*. W3C Recommendation, 15 December 2004.
- Lilley, Chris (2004) *How should the problem of identifying ID semantics in XML languages be addressed in the absence of a DTD?*. W3C TAG finding, 30 November 2004.
- Duce, David (editor) (1996-2003) *Portable Network Graphics (PNG) Specification (Second Edition)*. W3C Recommendation. 10 November 2003. Also published as Information technology — Computer graphics and image processing — Portable Network Graphics (PNG): Functional specification. ISO/IEC 15948:2003 (E).
- Lilley, Chris (2003) *Separation of semantic and presentational markup, to the extent possible, is architecturally sound*. Draft TAG finding, 30 June 2003
- Diaz, A. et al. (2001) *Component Extension (CX) API requirements Version 1.0*. W3C specification, 11 December 2001.
- Ferraiolo, Jon (editor) (2001) *Scalable Vector Graphics (SVG) 1.0 Specification*. W3C Recommendation. 4 September 2001.
- Bos, Bert; Lie, Håkon Wium; Lilley, Chris; Jacobs, Ian (1998) *Cascading Style Sheets, level 2*. W3C Recommendation, 12 May 1998.
- Boutell, T. (editor) (1997) *PNG: Portable Network Graphics Specification, Version 1.0*. IETF RFC 2083, March 1997.
- Lilley, Chris (editor) (1997) *Web Fonts*. W3C specification, 21 July 1997. This work was later merged into CSS2.
- Lilley, Chris; Platon, Roy (1997) *Use of CGM as a Scalable Graphics Format*. W3C specification, 18 June 1997.

Education

Sep 1993 - Apr 1994	**Postgraduate Diploma, Bioinformatics**; Global Network Academy/University of Bielefeld, Germany. This course used then-new electronic techniques such as the World Wide Web for course delivery, and multi-user interactive chat-rooms(MOO) for tutorials. I was a 'consulting student' (teaching assistant) on this course, my interest being in the technologies used as well as the course material.
Sep 1989 - Sep 1990	**Master of Science, Biological Computation**; Univeristy of York, UK. Thesis: *Browser: A tool for interactive examination of large Modula-2 programs*. An intensive computer science conversion course. Distinction.
Sep 1978 - May 1983	**Bachelor of Science, Biochemistry**; University of Stirling, UK. Honors degree.

Technical skills

I have a broad understanding of the full Open Web Stack of technologies, including:

- Colour Science
- Information abstraction and granularity, the URL, Web Architecture
- Typography, character encoding, the character/glyph model, text layout
- HTML (2 - 5)
- XML technologies, in particular SVG
- CSS (including CSS3/4/5)

I also have experience with a wide range of programming languages and technologies, including Pascal, Turbo Pascal, FORTRAN, Modula-2, Modula-3, Ada, C, Arduino/C++, JavaScript (ES6, together with the DOM & related APIs), Z80 and ARM Cortex assembly.

Languages

- **English**: Native speaker, rich vocabulary, high competence
- **French**: Good reading level, conversational competence

Professional memberships

From April 1987 to September 1989 I was an **Associate of the Institute of Medical Laboratory Sciences**. From April 1992 until March 1996 I was a **Member of Eurographics UK chapter**. I am currently an Individual Member of the International Typographic Association **(ATypI, Association Typographique Internationale)**. I am the W3C representative to the **International Color Consortium**.

Professional interests

Computer Graphics, primarily 2D, with special interest in technical illustration, interactive graphics, and scientific visualization. Typography, in particular advanced and non-Latin typography. Color theory and color management, particularly as it pertains to the Open Web; Open web standards, in particular the socio-political process of successful standardization. Compound documents and appropriate choices across the content-presentation gradient. Technical communication (writing, illustration, discourse).

Research interests

Information visualization. Color measurement, color appearance modelling, psychological and biological aspects of color vision. Sound synthesis, in particular subtractive and additive synthesis, sonic modelling, analog synthesis, novel microcontroller-based performance interfaces, sonic visualization.