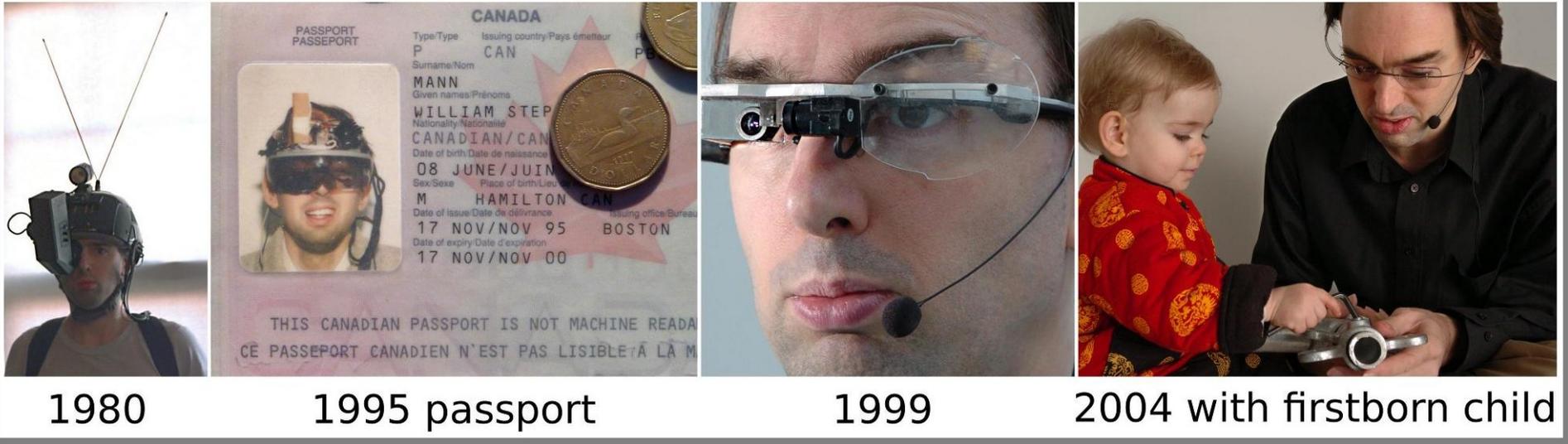
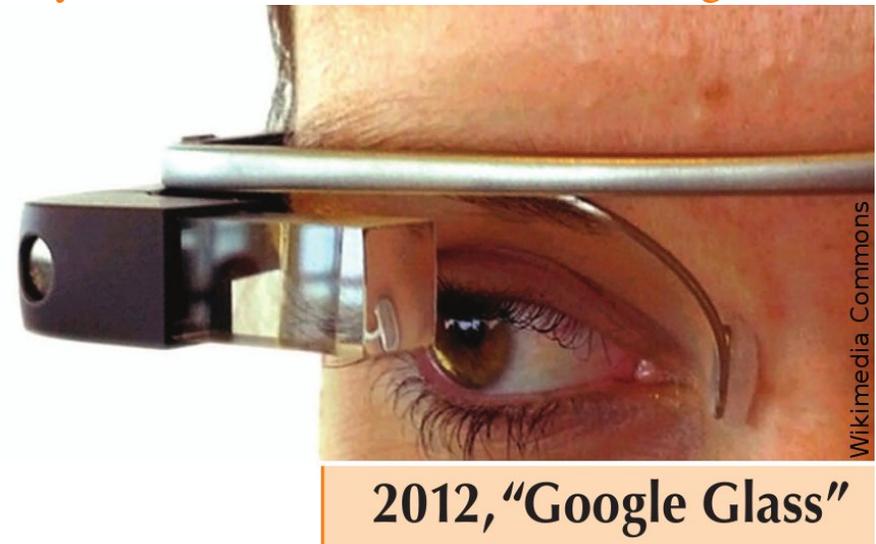
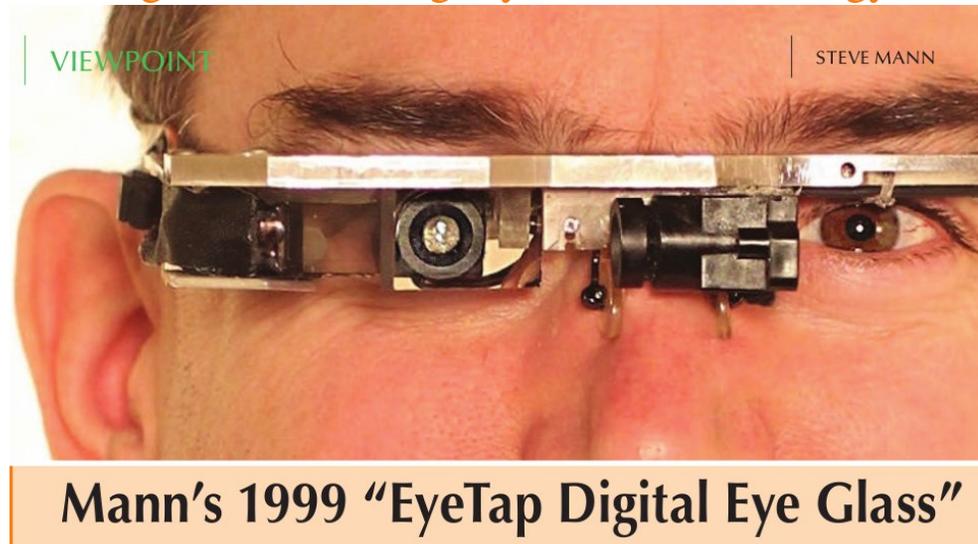


Steve Mann: Evolution of wearable computing in everyday life



“Through the Glass, Lightly”, IEEE Technology and Society, Vol. 31, Number 3, Fall 2012, Pages 10-14



Mann was recognized as “Father of AR” and the “Father of Wearable Computing” (IEEE ISSCC 2000)
... and Wearable Computing is now a \$241 billion industry!!!

Vision system for the blind

26 **ENGINEERING VISION**

Canadian Intellectual Property Office / Office de la propriété intellectuelle du Canada

Patent Summary

(12) Patent Application: (11) CA 2313693

(54) English Title: IMPLANTABLE CAMERA SYSTEM

(54) French Title: SYSTEME DE CAMERA IMPLANTABLE

Patent Details

(72) Inventors (Country): MANN, STEVE (Canada)

(22) Filed Date: 2000-07-19

FIG. 3A = EYE IMPLANT

Dmitri Vitaliev visits three Toronto men who have created a functioning camera eye – an invention with far-reaching applications

the eyeborg man



Photo Copyright Steve Mann, 2008

THE HISTORY of technological breakthroughs is littered with simple questions producing

'sousveillance' device. This term was coined by Mann to describe the recording of an activity from

taught engineer from Westwood, California, who had designed and developed this proof of

air balloon with a remote deflation system to conduct high-altitude air quality and pesticide

TECH SPECS OF THE VISION SYSTEM
"It's really onto simple"

Fox News and the Canadian Broadcasting Channel. Yet popularity has not brought



Mann's HDR (High Dynamic Range) imaging invention is used in nearly every commercially manufactured camera, including the Apple iPhone:

“The first report of digitally combining multiple pictures of the same scene to improve dynamic range appears to be Mann.³” -- M. A. Robertson et al.

Journal of Electronic Imaging / April 2003 / Vol. 12(2) / 219–228

References

1. S. Mann and R. W. Picard, “Video orbits of the projective group: A simple approach to featureless estimation of parameters,” *IEEE Trans. Image Process.* 6(9), 1281–1295 (Sep. 1997).
2. C. W. Wyckoff, “An experimental extended exposure response film,” in *SPIE Newsletter*, pp. 16–20 (June/July 1962).
3. S. Mann, “Compositing multiple pictures of the same scene,” *Proc. 46th Annual IS&T Conf.*, Boston, MA, pp. 50–52, May 9–14, 1993.
4. S. Mann and R. W. Picard, “On being ‘undigital’ with digital cameras: Extending dynamic range by combining differently exposed pictures,” *IS&T’s 48th Annual Conf.* Washington, D.C., pp. 422–428, May 7–11, 1995.

**United States Patent 5,828,793
Mann**

[54] **METHOD AND APPARATUS FOR PRODUCING DIGITAL IMAGES HAVING EXTENDED DYNAMIC RANGES**

[75] **Inventor: Steve Mann, Cambridge, Mass.**

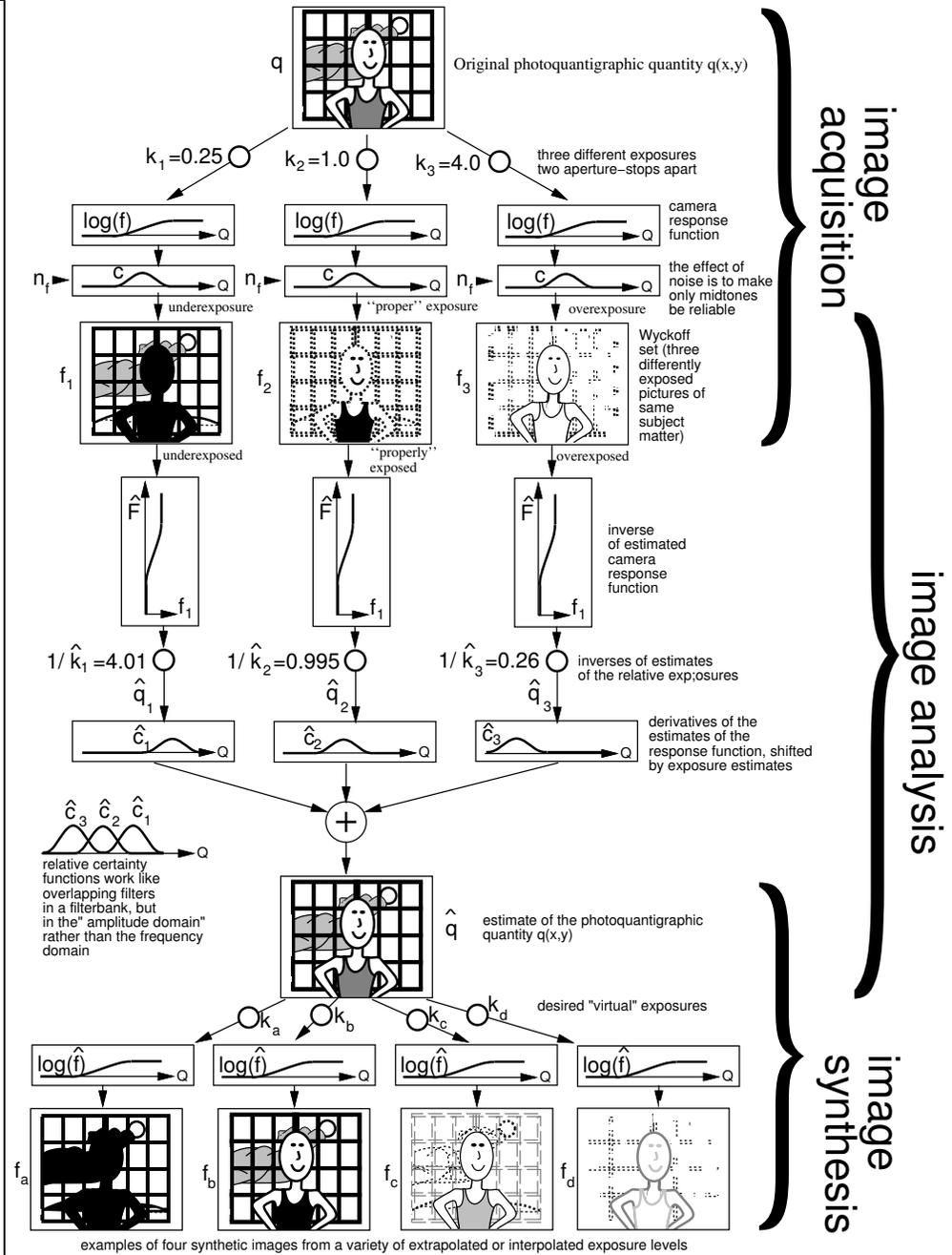
[73] **Assignee: Massachusetts Institute of Technology, Cambridge, Mass.**

[22] **Filed: May 6, 1996**

OTHER PUBLICATIONS

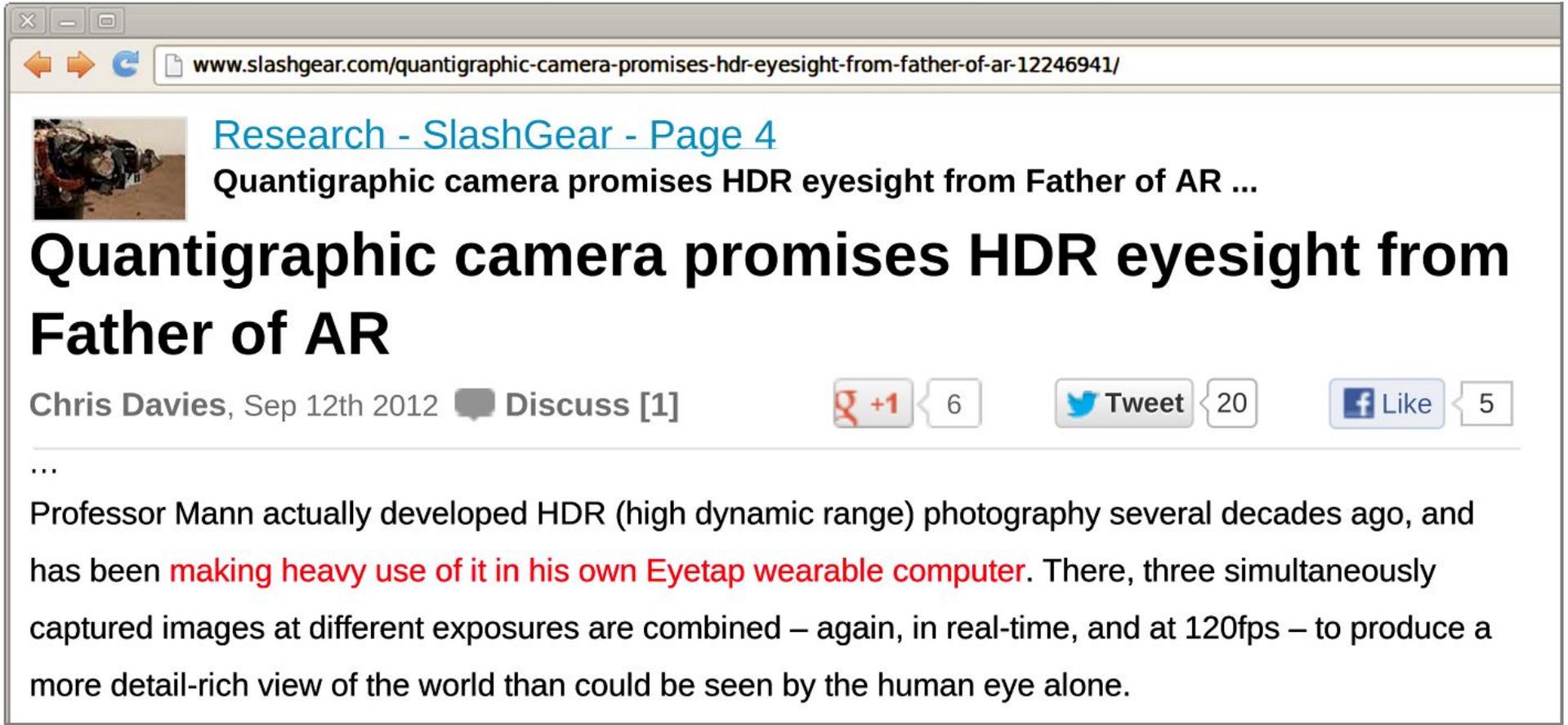
Mann, Steve; “Compositing Pictures of the Same Scene,” Massachusetts Institute of Technology, Cambridge, MA 02139.

Mann, Steve; “Lightspace,” MIT Media Laboratory, Information and Entertainment Systems Group, Dec. 1992.



HDR (High Dynamic Range) Imaging, and Computational Photography, Steve Mann, 1992

AR (Augmented Reality) becomes a widespread phenomenon:



The screenshot shows a web browser window with the URL www.slashgear.com/quantigraphic-camera-promises-hdr-eyesight-from-father-of-ar-12246941/. The page title is "Research - SlashGear - Page 4" and the main heading is "Quantigraphic camera promises HDR eyesight from Father of AR". The author is Chris Davies, dated Sep 12th 2012. There are social media sharing buttons for Google+ (6), Twitter (20), and Facebook (5). The article text begins with "Professor Mann actually developed HDR (high dynamic range) photography several decades ago, and has been making heavy use of it in his own Eyetap wearable computer. There, three simultaneously captured images at different exposures are combined – again, in real-time, and at 120fps – to produce a more detail-rich view of the world than could be seen by the human eye alone."

AR+HDR to help the blind;

AR+HDR to help the visually challenged (partial sight);

AR as a new industry.

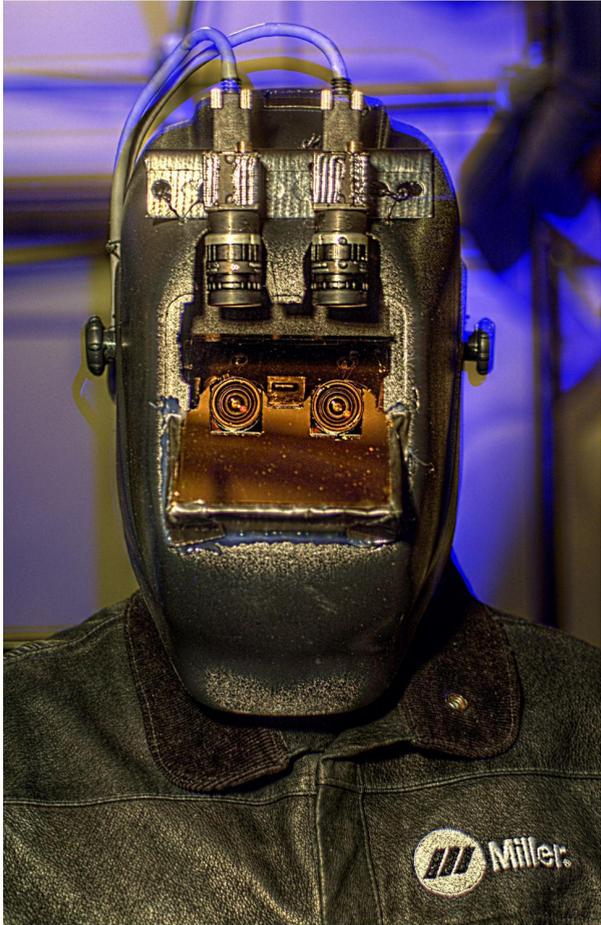
Quantigraphic camera promises HDR eyesight from Father of AR

Chris Davies, Sep 12th 2012 [Discuss \[1\]](#)

[+1](#) 6

[Tweet](#) 20

[Like](#) 5



...
Traditional welding helmets use a sheet of smoked glass for the eyepiece, cutting down on the dangerous glare from the welding process itself, but also reducing overall visibility. The HDRrchitecture system, instead, processes images coming from one or more cameras, rendering a Full HD, 30fps stream with the brighter elements stripped out but the core details retained, all in real-time.

Mann's Sensor-camera (Lifeglogging/Lifeloggng) invention is now in widespread use:



Wearable Wireless Webcam
1998, Mann



SenseCam
2004, Microsoft



Lifeloggng Camera
2012, Memoto

Service to the Community:

IEEE International Symposium on Technology and Society, 2013, Steve Mann, General Chair



*Advancing Technology
for Humanity*

World's largest technical society



Insert credit card to retract seat spikes!
S. Mann, San Francisco Art Institute, 2001



Fingerprint-scanning briefcase designed to be opened by anyone except the owner. Therefore, a security guard wishing to search the owner's case must submit to being fingerprinted! Leonardo Award for Excellence, S. Mann, 2004

As a designer, artist, scientist, technologist, engineer, and mathematician, and Renaissance humanist, Mann is interested in ALL aspects of *Advancing Technology for Humanity!*