

## "Treesigners" -- -- Tree-Shaped Designers

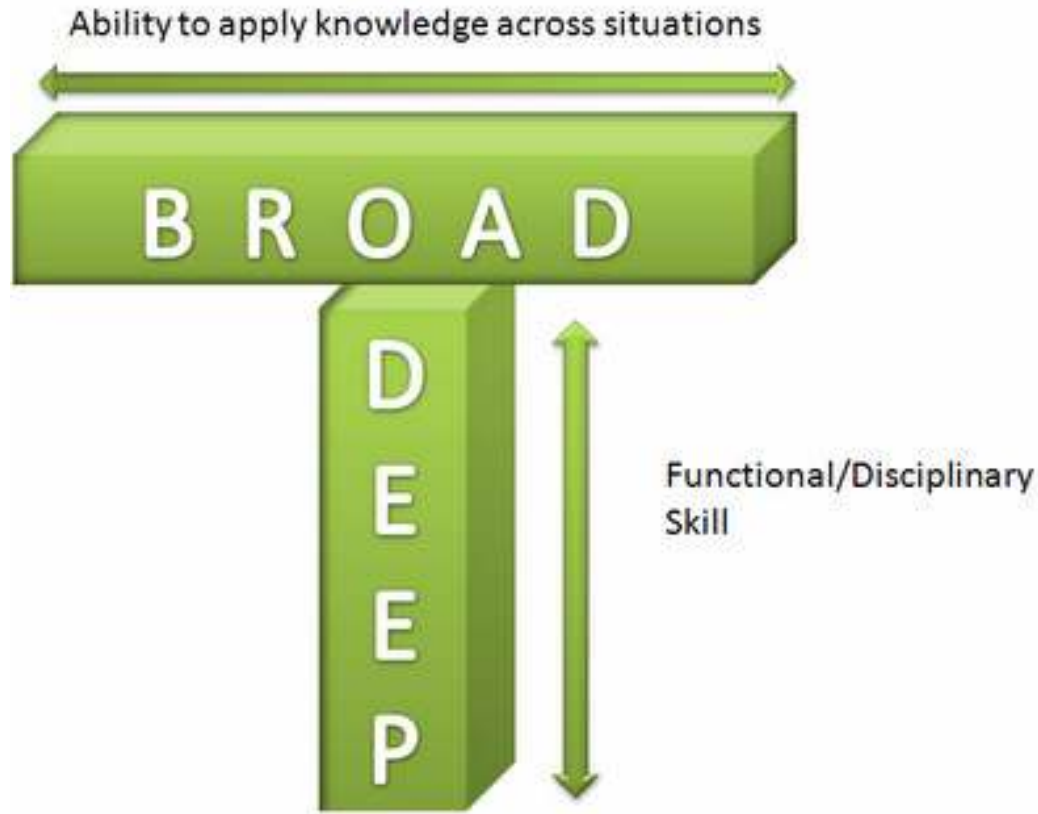


Steve Mann, (Eng.+ArtSci+Forestry, UofT)

2013 December 5, 10:30am, Keynote Address, eLeo Symposium, OCAD University

Acknowledgements: Thanks to S. Diamond (Banff 2002!!!) and T. Barker for invitation... Ongoing

# T-Shaped Skills and T-Shaped Designers

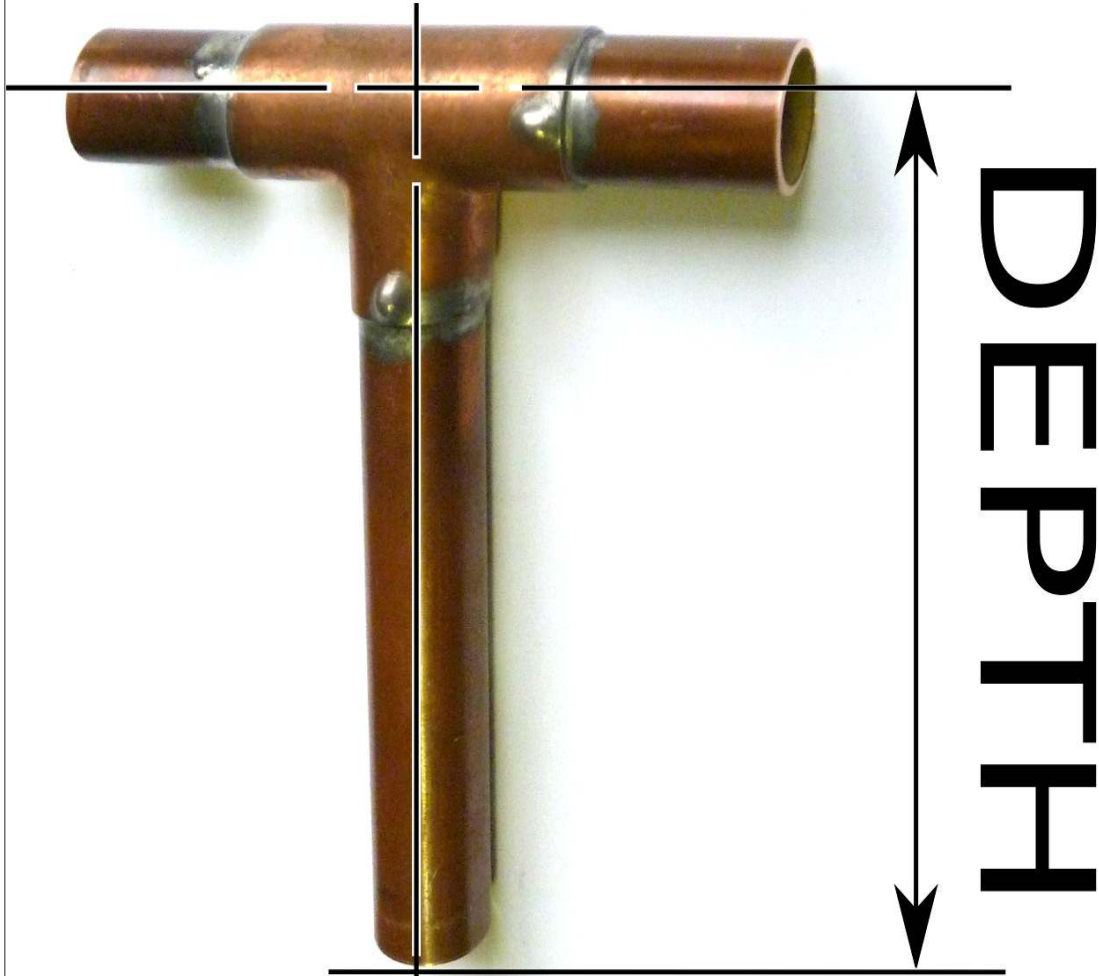


Conceived by David Guest in 1991

["The hunt is on for the Renaissance Man of computing," , The Independent, September 17, 1991. ]

Popularized by Tim Brown, CEO and president of IDEO

# BREADTH

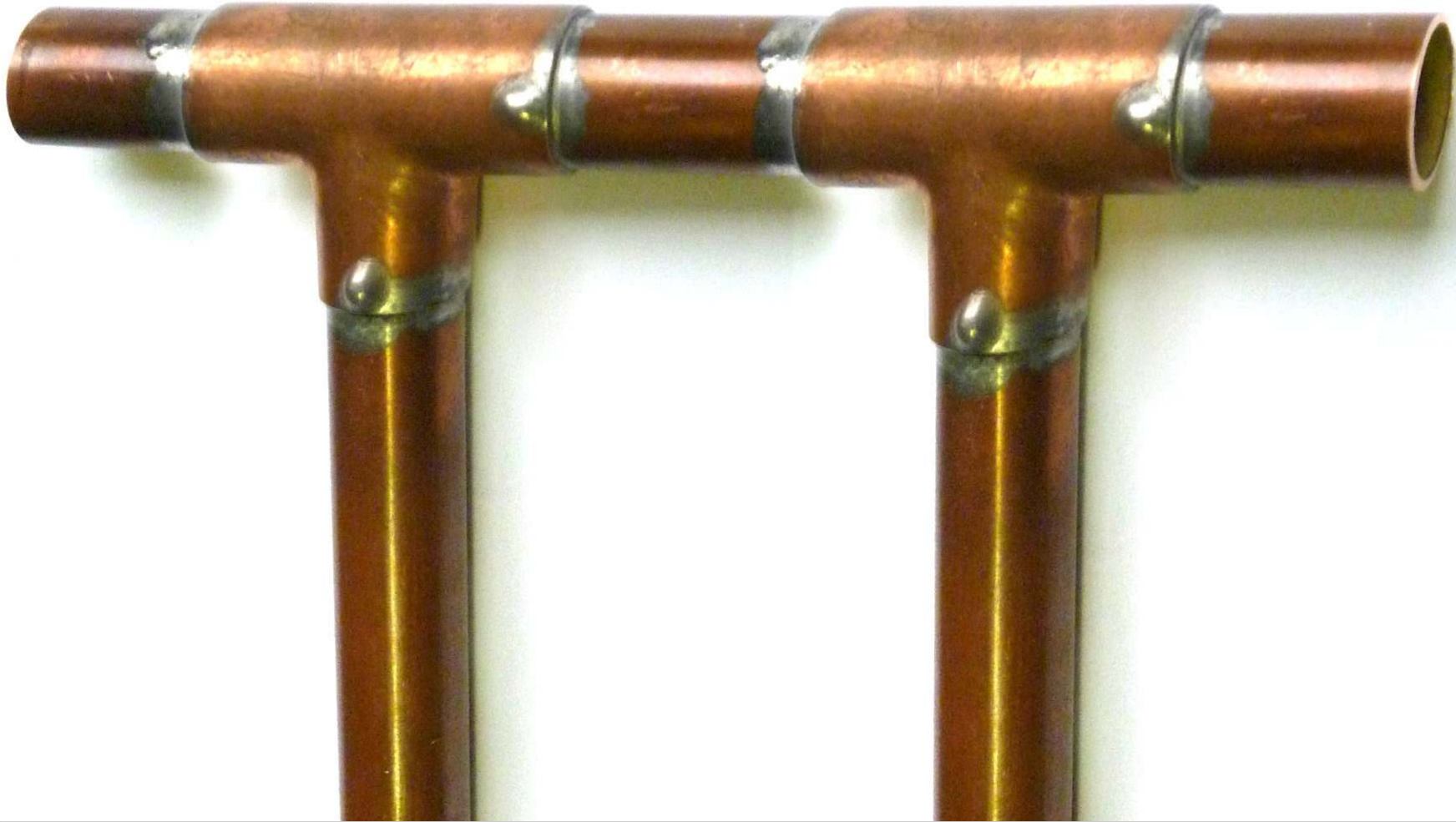


Tee-Shaped  
Skills, and  
Tee-Shaped  
**Designers.**

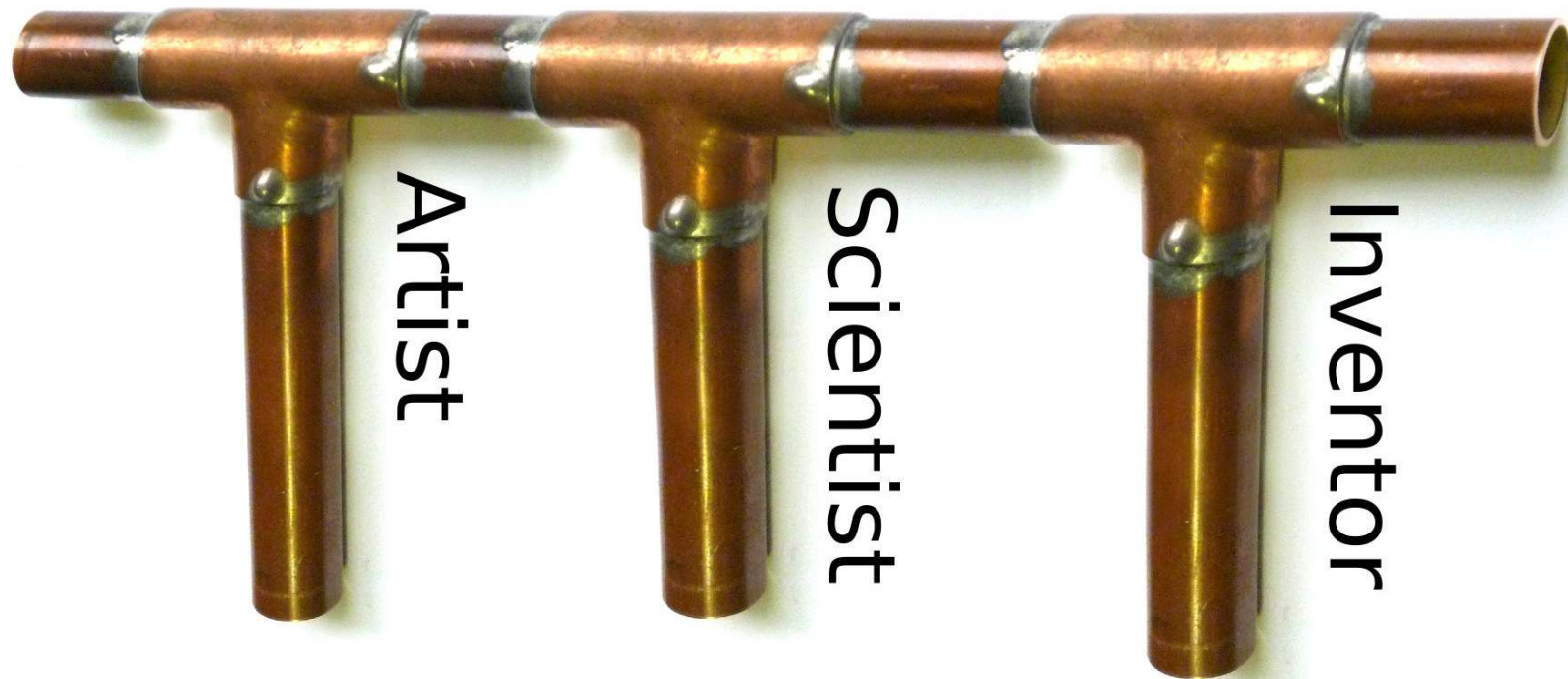
Creativity  
Flows!

S. Mann  
2005

Pi-Shaped Design Team, ... University as a design factory.  
Buy and sell people like commodities: assemble for productivity.



Could we re-create Leonardo da Vinci with a team of 3 people?  
It would be like composing a symphony orchestra by committee!



Let me introduce something I call the \*-shaped designer.  
The "\*" symbol in UNIX is a symbol for anything  
Shapeshifters -- -- Any-Shaped Designers...

# The X-Shaped Designer

Introduced by Rooke&Torbert. 2005. Refined by Smith 2008.

- I-Shaped 36% of designers: 1 area of speciality.
- T-Shaped 30% of designers: Broad + Deep in 1 area.
- H-Shaped 11% of designers: 2 areas of speciality.
- X-Shaped 03% of designers: "Me" at the center.

Art, Science, Engineering, and Business.

Rooke, Torbert, and Smith define X-Shaped People as loners and sociopaths.

Allege that X-shaped people are not a good fit for Western society!

[Harvard Business Review 2005, Interkonnektions 2008.]

Collaborative effort to "revive" the X-Shaped Designer:  
T. Barker, S. Diamond, and S. Mann



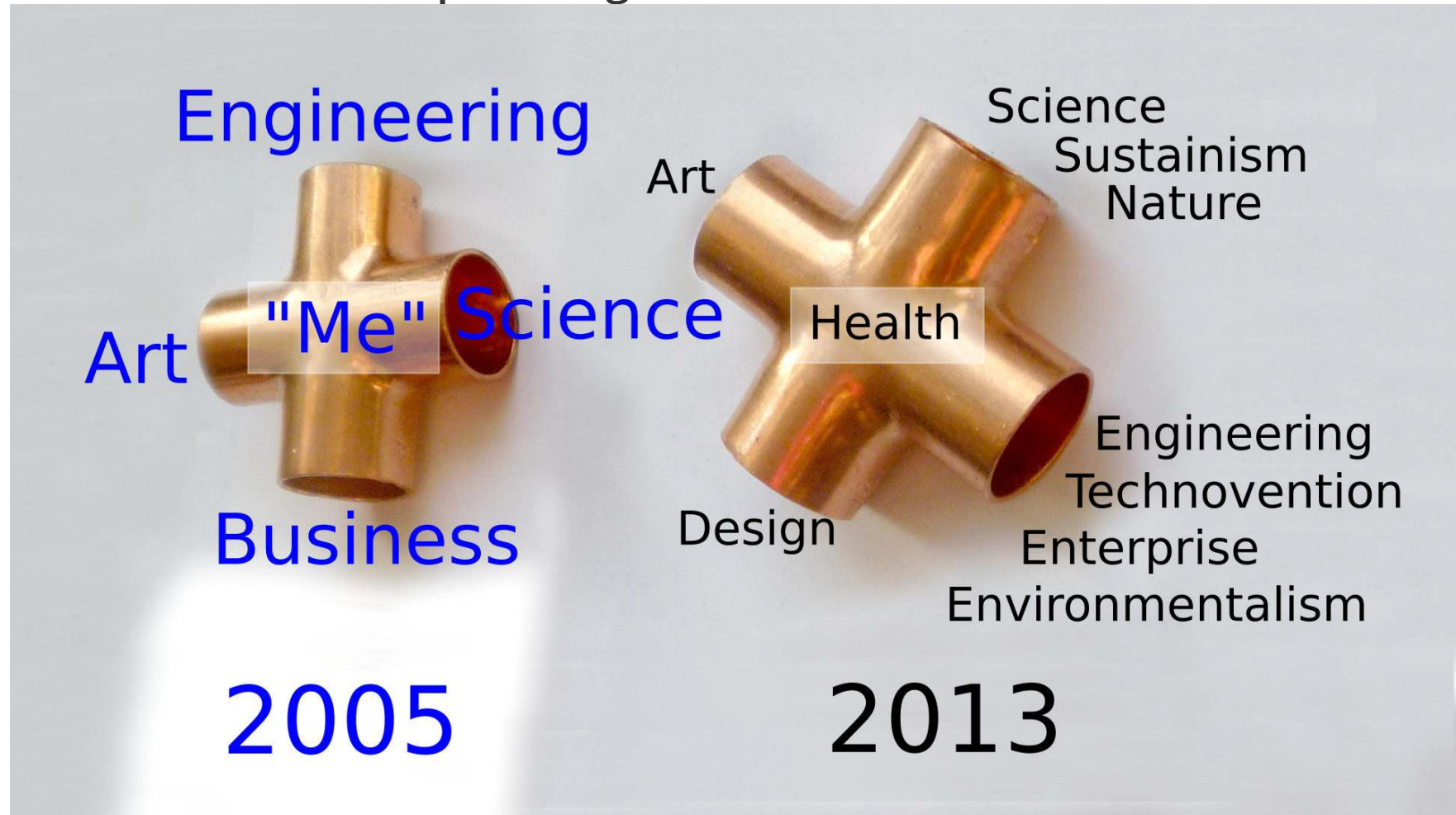


"Cross fittings" are useful for connecting work flow among people





Let's rescue the X-Shaped Designer from extinction -- -- X2.0



Engineering

Art

"Me"

Science

Business

2005

Art

Science

Sustainism

Nature

Health

Design

Engineering

Technovention

Enterprise

Environmentalism

2013

Education

Technology



Nature

Health



My love for you flows from my heart  
Like warm water from an endless pipe  
The seeds inside you so sweet and ripe  
The torch of love, we never part  
--Stan 2005 Feb 14.



Tee-Shaped Skills

Tree-Shaped Skills

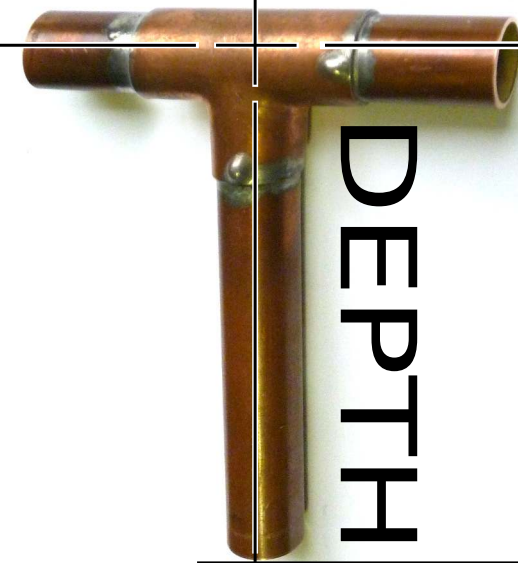
BREADTH

BREADTH

HEIGHT

DEPTH

DEPTH



# Tinquiry and Praxistemology

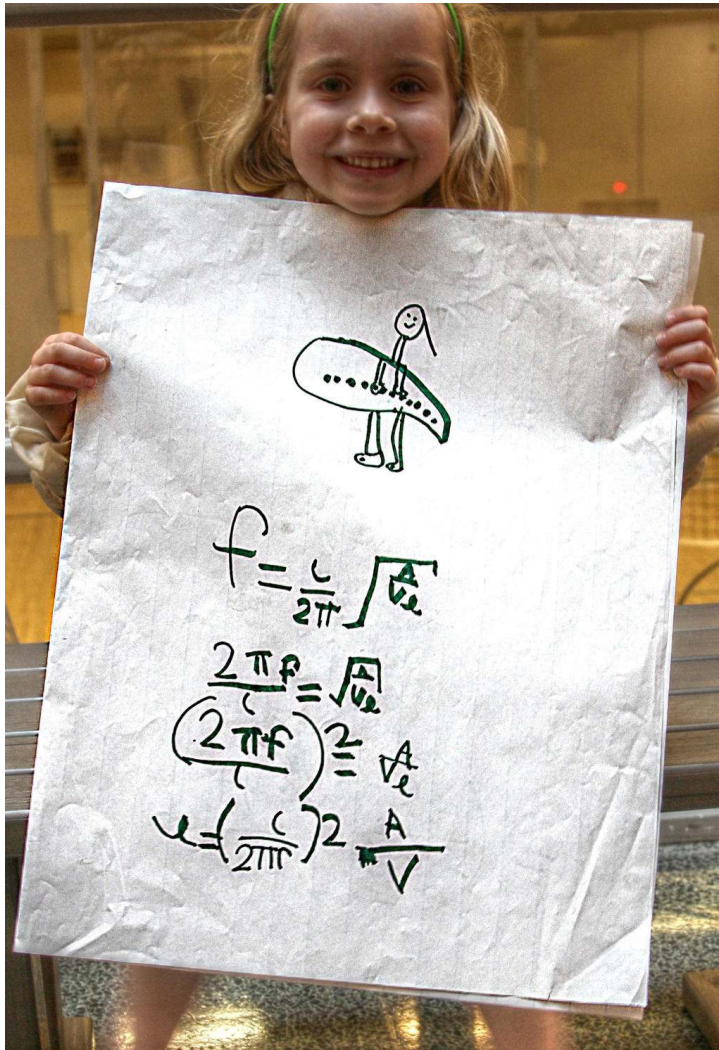
Educational framework for Tree-Shaped Designers

Praxistemology = Praxis of Existential Technology: Self-determination, Authenticity, ...

Tinquiry = Tinkering as a form of Inquiry: Maktivism...

Grant proposals, ongoing collaboration, etc..

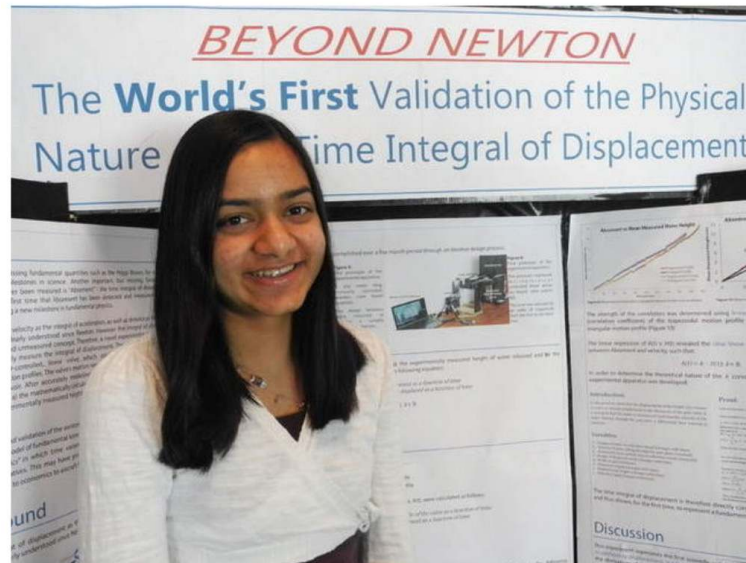




## 14-year-old from Oro-Medonte sets her sights on Isaac Newton's theories



By Roberta Bell, Orillia Packet & Times  
Tuesday, March 26, 2013 6:45:03 EDT PM



Fourteen-year-old Maya Burhanpurkar of Oro-Medonte has come up with a method of measuring the time integral of displacement and developed a project that proves it has a significance. She will be competing at the Intel International Science and Engineering Fair in Phoenix, Ariz., in May. **ROBERTA BELL - THE PACKET & TIMES**

For more than 300 years, the base of fundamental physics laid by Isaac Newton has remained more or less unchallenged.

Then Oro-Medonte's 14-year-old Maya Burhanpurkar looked into it.

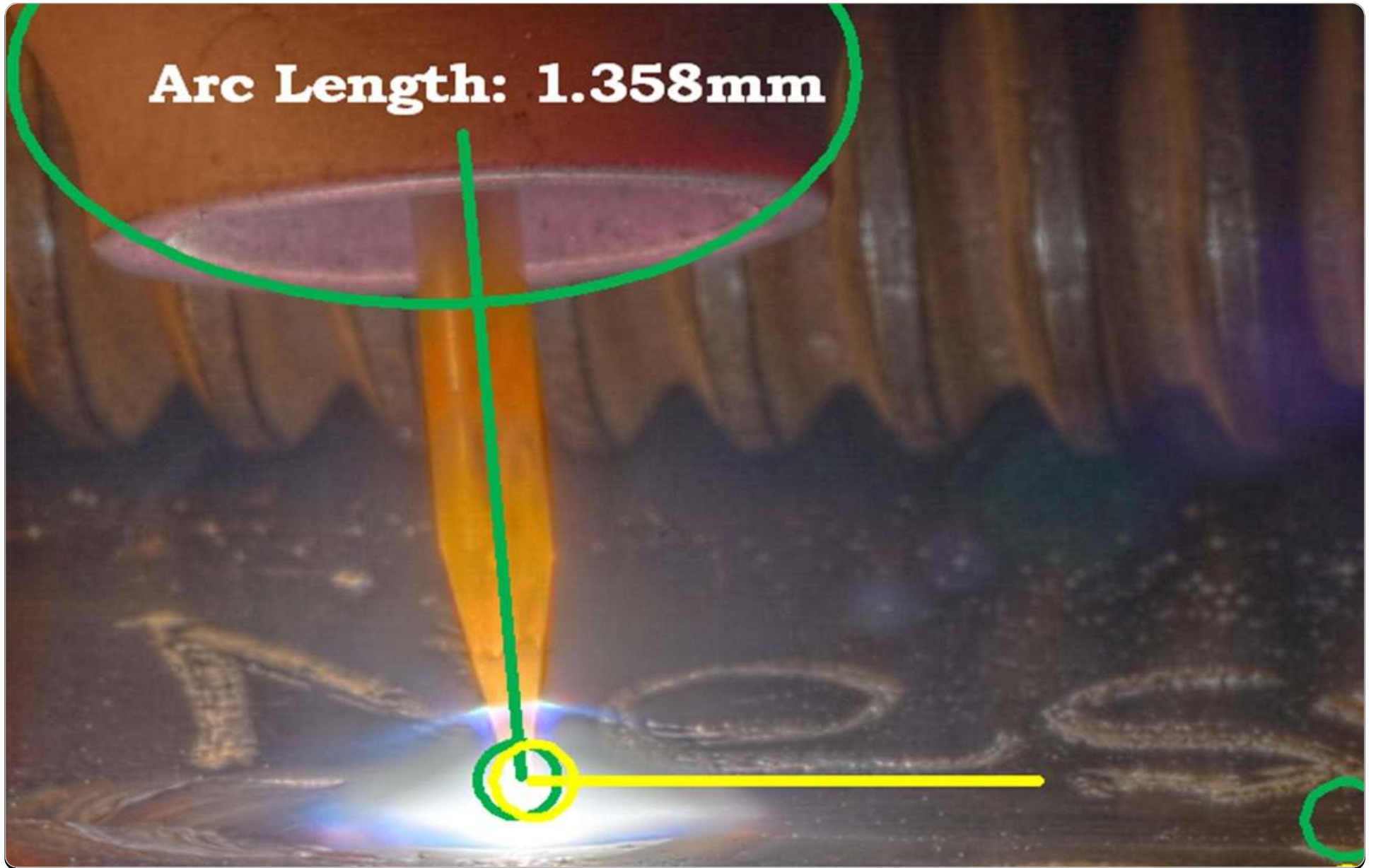
Until now, scientists have only really been considering derivatives of distance, as outlined by Newton, said Burhanpurkar, who has come up with a project validating the last fundamentally unknown quantity in his model.

"Distance, velocity, acceleration — those are all things we're able to measure, but the integral of displacement is something that hasn't ever been investigated before,"

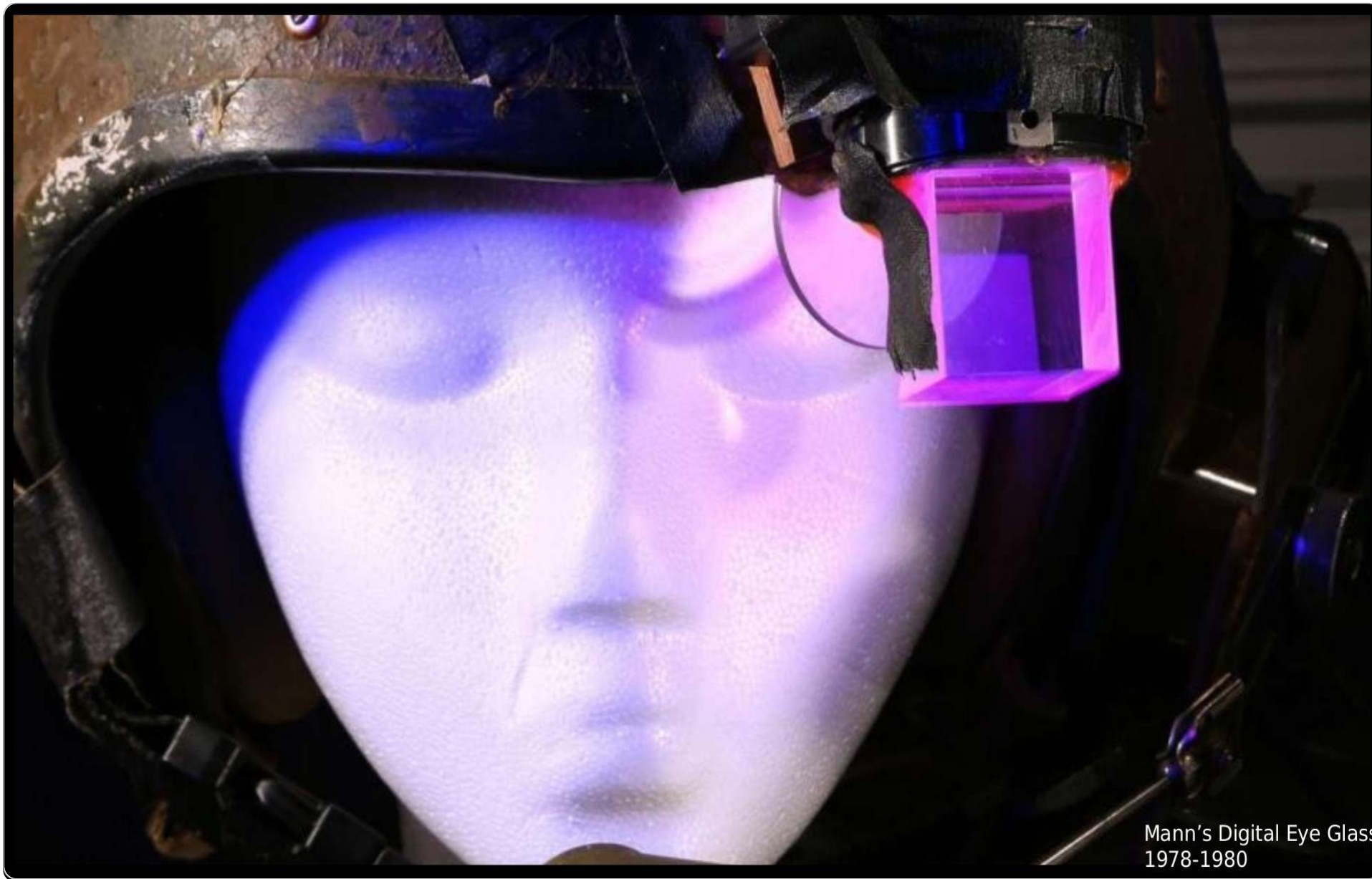
WearComp/WearCam... When I was 4 years old...



**Arc Length: 1.358mm**







Mann's Digital Eye Glass  
1978-1980

## MannGlass 1980



## SpeedGlas 1981

(acquired by 3M in 2004)



 **Speedglas™**



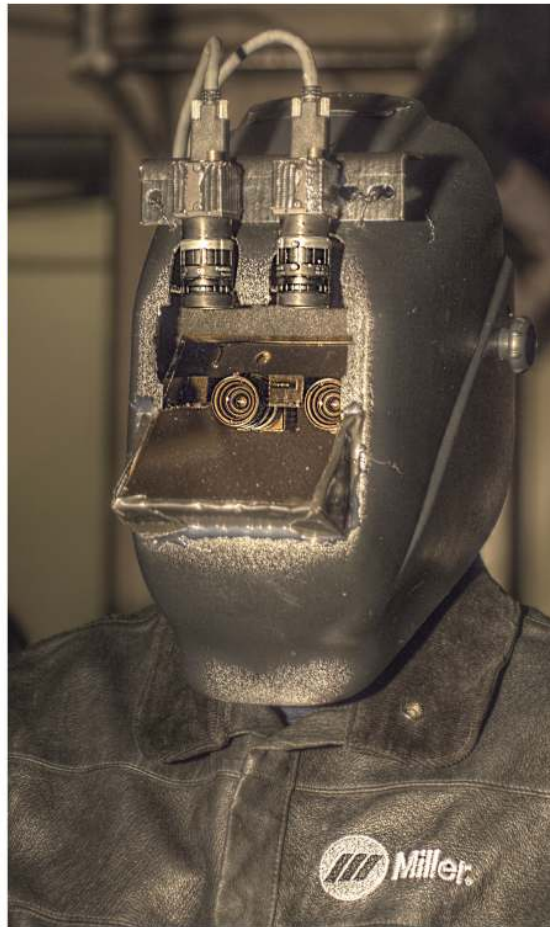
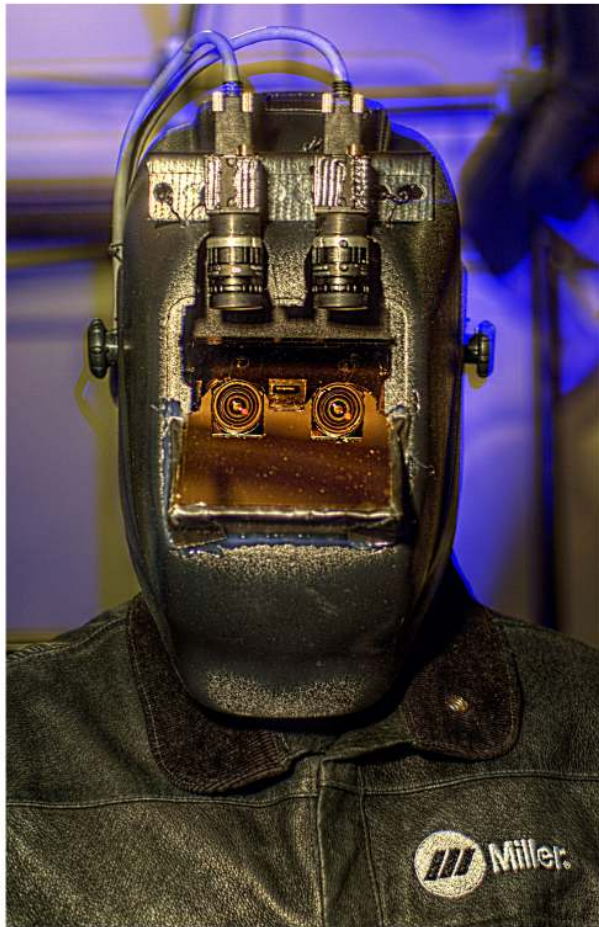
# Quantigraphic camera promises HDR eyesight from Father of AR

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

[+1](#) 6

[Tweet](#) 20

[Like](#) 5



# Digital Welding Glass to help people SEE BETTER!...

## Augmented Reality in Quantigraphic Lightspace and Mediated Reality with remote expert



“The first report of digitally combining multiple pictures of the same scene to improve dynamic range appears to be Mann.<sup>3</sup>” -- 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.**

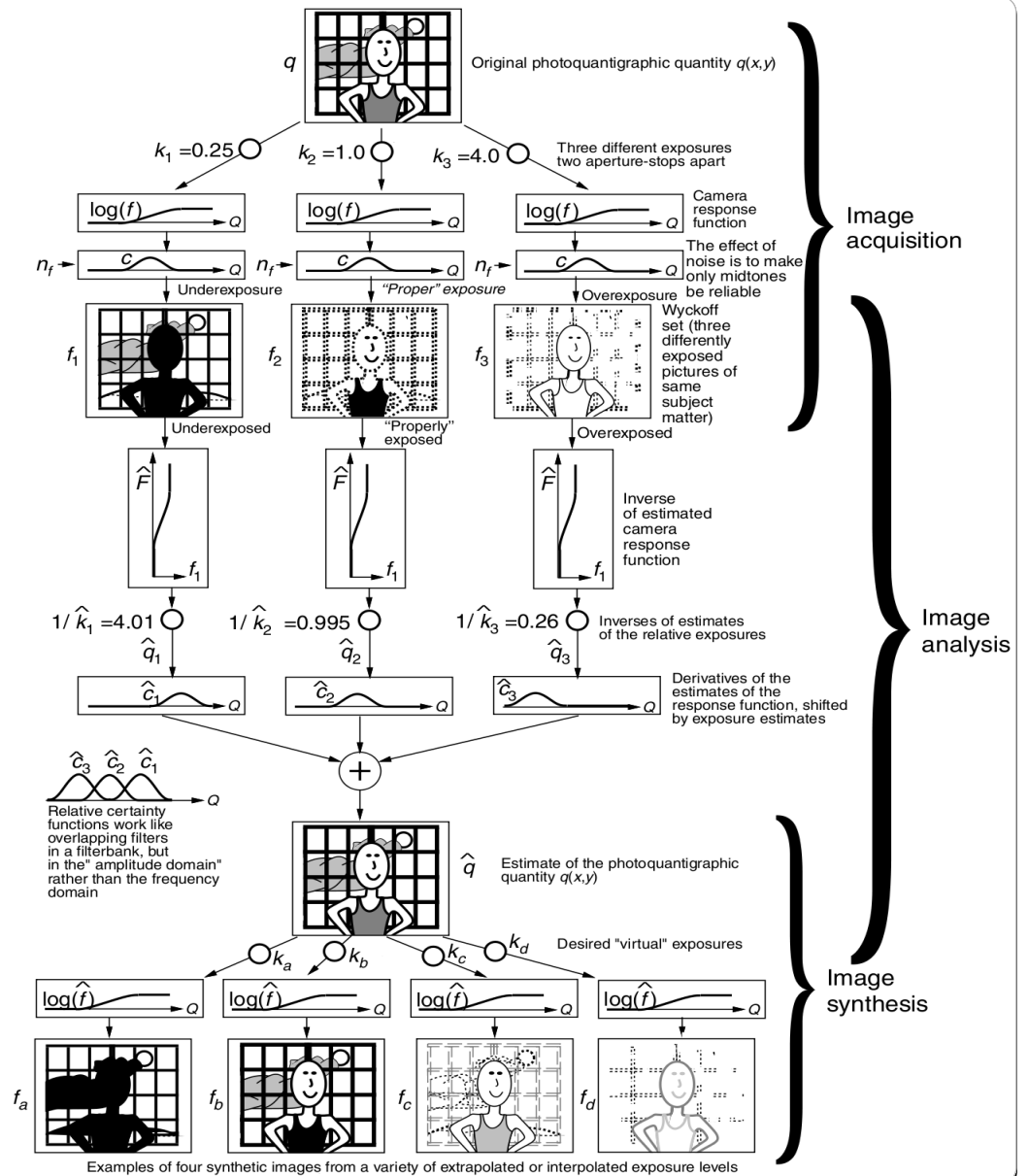
[73] **Assignee: Massachusetts Institute of Technology, Cambridge, Mass.**

[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.



## Founding of the MIT Wearable Computing Project: Early 1990s



3:21



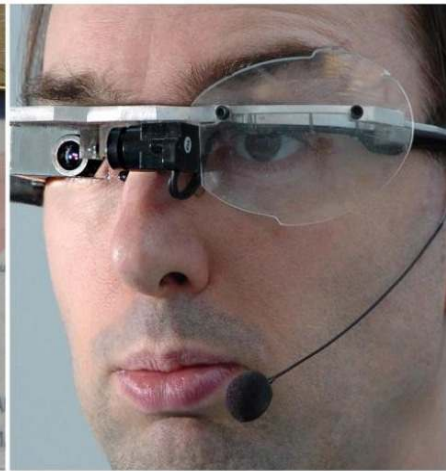




1980



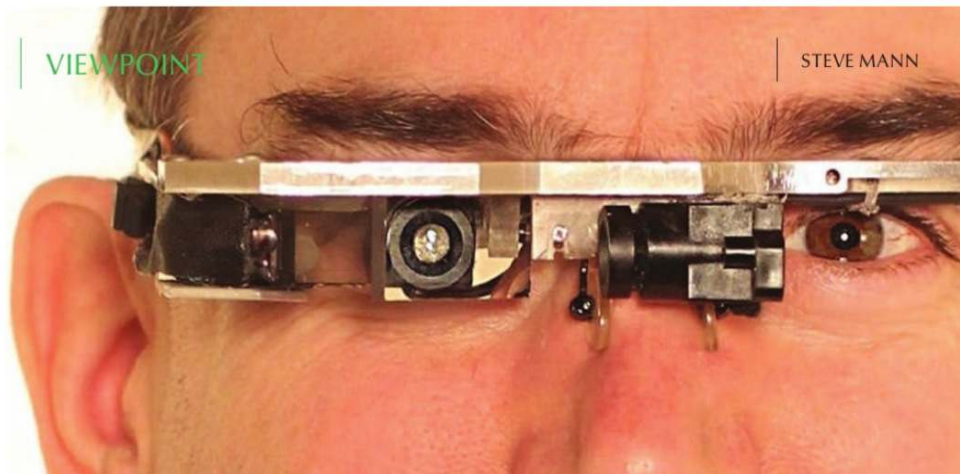
1995 passport



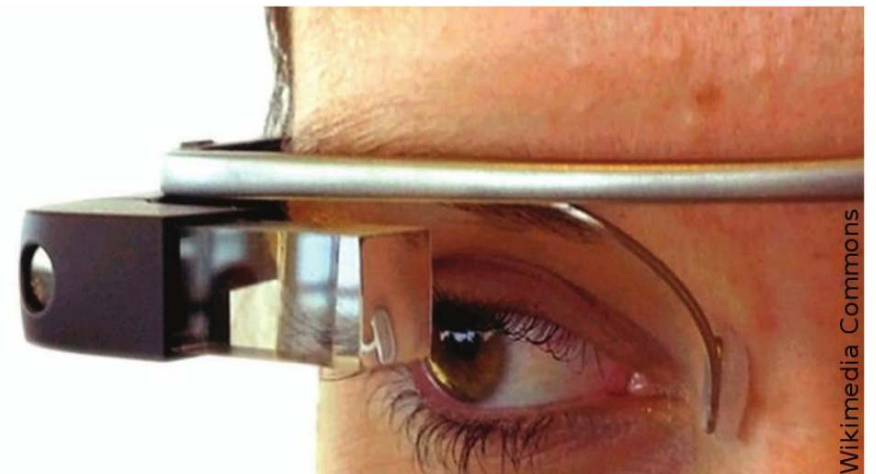
1999



2004 with firstborn child



Mann's 1999 "EyeTap Digital Eye Glass"



2012, "Google Glass"

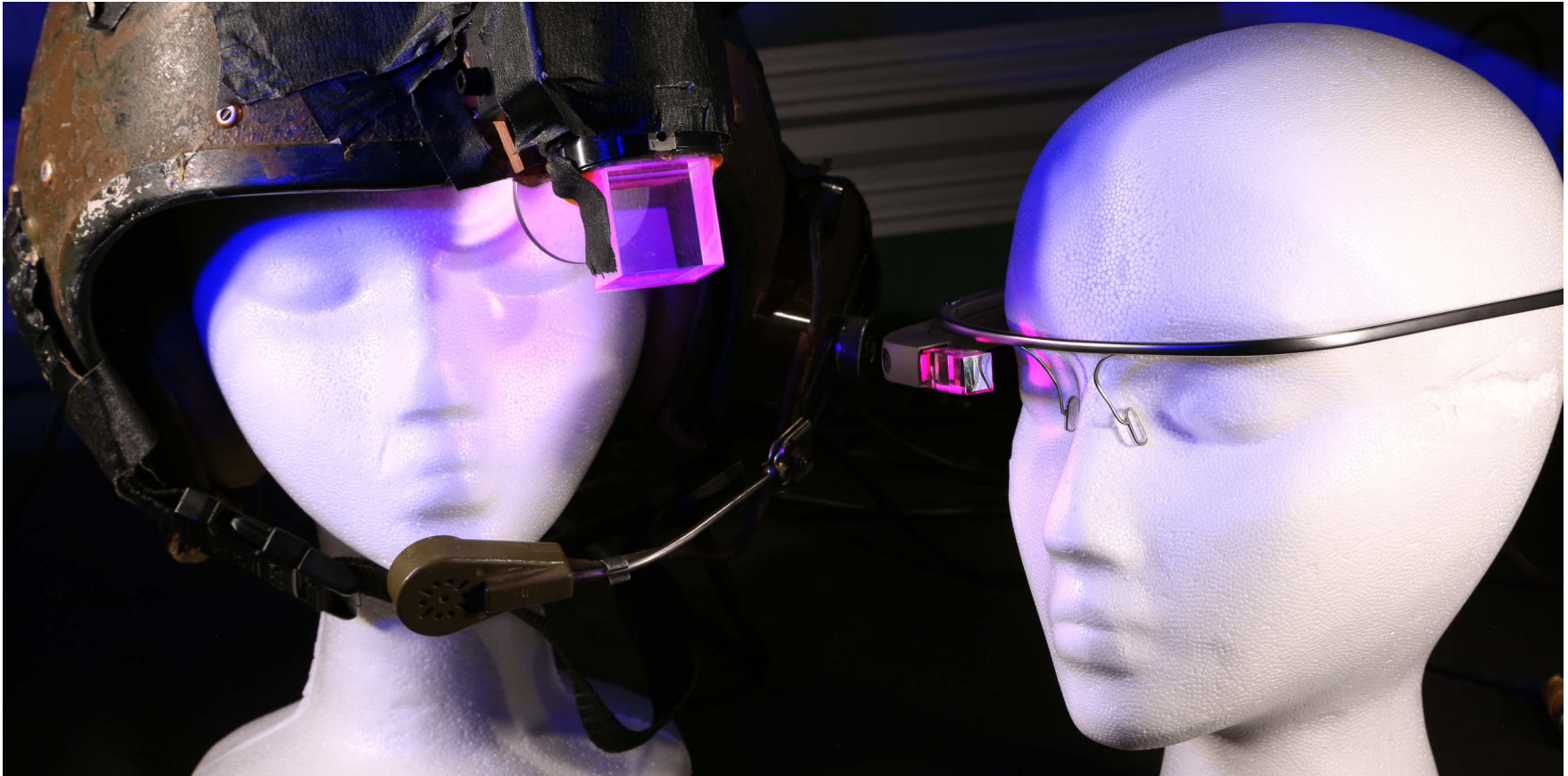


MannGlass 1998 (15 years ago):



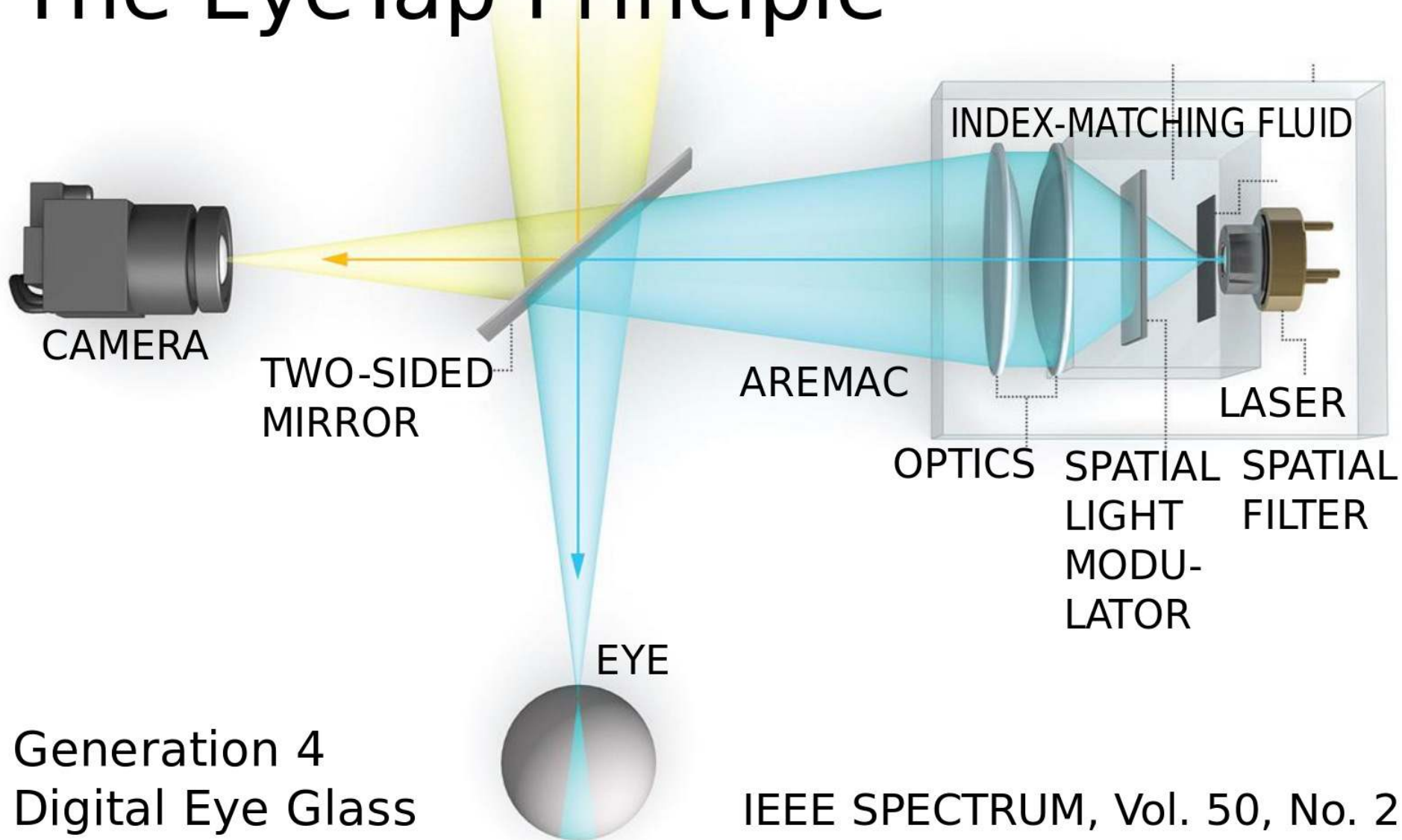
Thin strip of metal wraps around the head;  
No hinges: 1-piece construction.

# 35 years of Digital Eye Glass



MannGlass 1978 and **GOOG**lass 2013  
Both of these are Generation-1 DEG

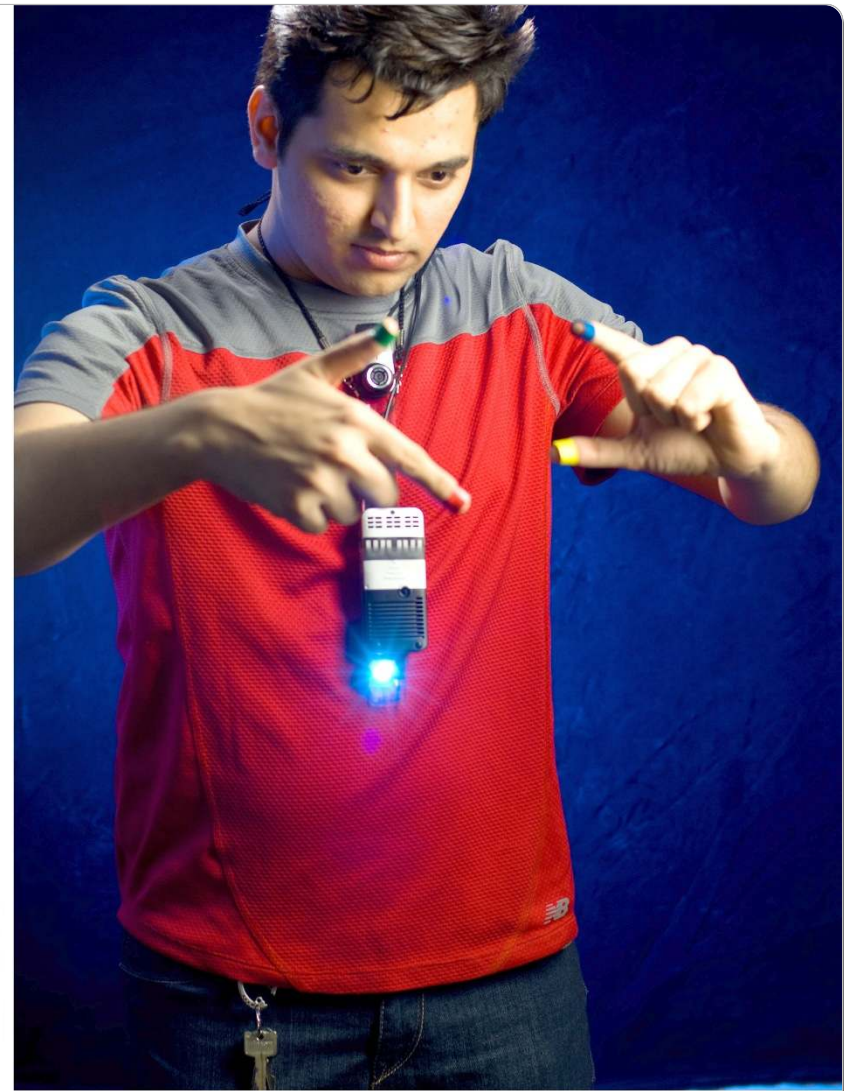
# The EyeTap Principle







Mann 1998



Mistry 2009

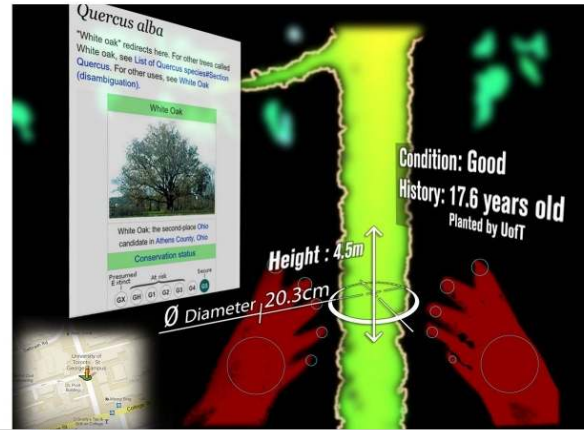




Mann 1998



Mistry 2009





3:21



Many inventions come from research labs.

But WearComp, DEG, SixthSense, HDR, etc., are inventions that came from my everyday life.

In this respect these technologies are very much **in and of the real world**, not just the lab!





**IEEE**

*Advancing Technology  
for Humanity*

The world's largest professional association  
for the advancement of technology

Hunched over a desktop metaphor.



<http://gokaleo.com/>



Implantable camera system:  
Vision system for the blind  
and partially sighted.

Canadian Pat. 2313693, July 2000, S. Mann





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

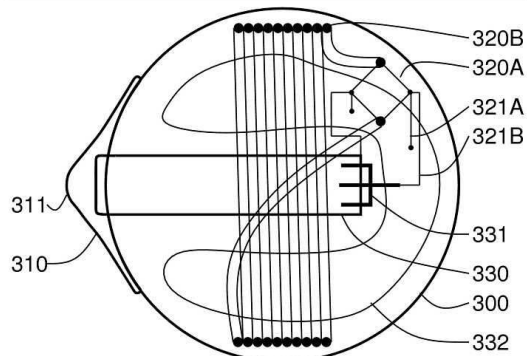


FIG. 3A = EYE IMPLANT

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 quite simple"

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



# World's first wristwatch videophone

Steve Mann, 1998, June 1999, July 2000

Canadian Intellectual Property Office  
An Agency of Industry Canada

Office de la propriété intellectuelle du Canada  
Un organisme d'Industrie Canada

Canada

## Canadian Patents Database

### Patent Summary

(12) Patent: (11) CA 2275784  
 (54) English Title: WRISTWATCH-BASED VIDEOCONFERENCING SYSTEM  
 (54) French Title: SYSTEME DE VIDEOCONFERENCE SUR MONTRE-BRACELET

### Patent Details

(72) Inventors (Country): MANN, STEVE (Canada)  
 (45) Issued: 2000-10-24  
 (22) Filed Date: 1999-06-29  
 (41) Open to Public Inspection: 1999-12-29  
 Examination requested: 1999-06-29  
 (30) Availability of licence: Yes

### (30) Application Priority Data:

Application No.	Country	Date
2,237,939	Canada	1998-06-29
2,247,649	Canada	1998-10-13
2,248,473	Canada	1998-10-29

ISSCC: 'Dick Tracy' watch watchers disagree

By Peter Clarke  
 EE Times  
 (02/08/00, 9:12 p.m. EST)

SAN FRANCISCO -- Panelists at a Monday evening (Feb. 7) panel session at the International Solid State Circuits Conference (ISSCC) here failed to agree on when the public will be able to buy a "Dick Tracy" style watch for Christmas, with estimates ranging from almost immediately to not within the next decade.

Steve Mann, a professor at the University of Toronto, was hailed as the father of the wearable computer and the ISSCC's first virtual panelist, by moderator Woodward Yang of Harvard University (Cambridge Mass.).

### A GNU/Linux Wristwatch Videophone

Jul 01, 2000 By Steve Mann  
 in Audio/Video

This fully functioning prototype, designed and built by Steve Mann in 1998, was demonstrated in 1999, and later used to deliver a videoconference at ISSCC 2000. ...

<http://www.linuxjournal.com/issue/75>

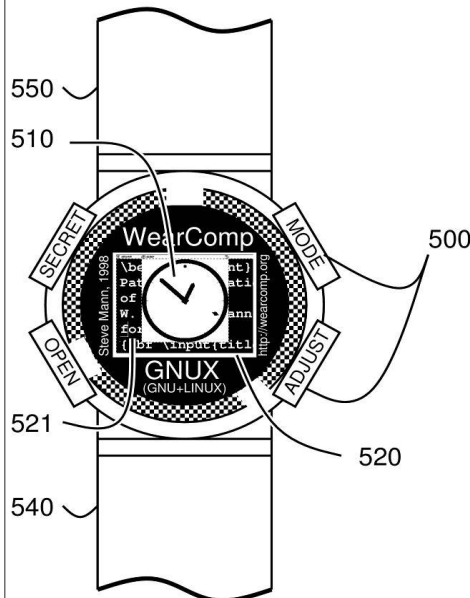


FIG. 5a: WRISTWATCH VIDEOPHONE CLOCKFACE

Cite/Reference the above patent and LJ 2000 article:  
 Title "A GNU/Linux Wristwatch Videophone", by Steve Mann, Linux Journal, Issue 75, July, 2000, Pp 86-91+Cover.

AN SSC PUBLICATION **Getting NT out and LINUX in**

LINUX JOURNAL

**LINUX JOURNAL**

The Monthly Magazine of the Linux Community • JULY 2000

**SYS-ADMIN TOYS**

**CYGBIN**  
 GNU Opens the Door to Windows NT  
**MEDUSA DS9**  
 Crackers for Security UNDERSTUDY  
 Clustering Backups  
**PCI SYMPHONY**  
 Wireless Networking

**MAPPING LIGHTNING**  
 storm morphology —three spatial dimensions of battling electrons

**GRI**  
 a precision tool for technical illustration helps coastal dwellers

**PREDICT**  
 satellite tracking goes open-source—a boon to meteorologists

**FUTURE TECH**  
 What will you be wearing tomorrow?

Steve Mann, 2000

WearComp

GNUX (GNU+LINUX)

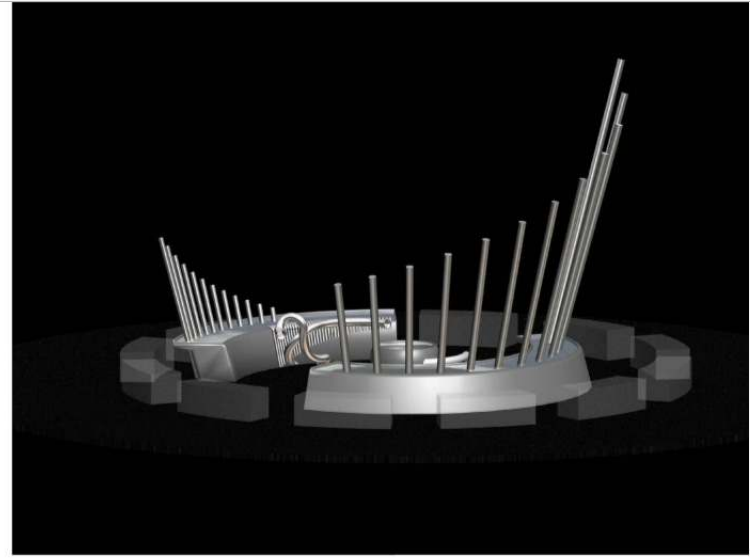
http://wearcomp.org

USA \$5.00 CAN \$6.50

74470844525

Steve Mann on the WearComp Project





# hydraulophone

civic sculptures + musical instruments





# Hydraulophone



# Hydraulophone



**Toronto: Home of the world's largest hydraulophone!!!**

- Main centerpiece in front of landmark architecture site;
- Water conservation: sophisticated recirculation system;
- Permanent public art installation open 24 hours a day.







# Universal access: Age, Ability... Outdoor Classroom: Forest of Tree-Shaped Designers!

## Alumni news

### CATHY MCFEE: CNIB OPENS INNOVATIVE OUTDOOR CLASSROOM FOR CHILDREN

BY SARAH FABBRI

A young boy in a playground giggles when he discovers that a special water fountain he is playing with makes different sounds when he moves his fingers – like a keyboard. The boy is blind and he's playing on something called a hydraulophone which is helping him learn more about the world around him. He's in the CNIB's (Canadian National Institute for the Blind) recently opened Outdoor Classroom in Calgary. It's the first facility of its kind in Canada.

"We have created something that has tremendous meaning for these children and their families," says Cathy McFee, Director of Services and Operations, CNIB - Alberta NWT Division. McFee received her Leadership Development Certificate of Excellence last spring and says her Banff Centre experiences played an important role in the development of the Outdoor Classroom.

The idea for the classroom started more than two years ago when employees with Urban Systems, a Calgary consulting

firm, were involved in the design of the facility. "It was about developing a sensory playground to better meet the needs of children with vision loss," she says. Currently CNIB Calgary has about 80 preschool children registered with its services.

"We started to ask ourselves questions such as: Who uses this space? How is it used? How does it compliment the services of the CNIB program?" says Leighton Ginther of Urban Systems.

There was a lot of enthusiasm and creativity, recalls McFee. "We pulled together an exciting plan. We designed an educational facility where children with vision loss could explore, develop skills, and build confidence in a safe, interactive and accessible environment."

Plans featured a tactile map at the entrance to help children mentally map the outdoor space, a looped pathway system to give children the opportunity to develop their orienteering skills, a xylophone, and a sound bench.



Leadership Development program, *Leading Teams for High Performance*.

During *Leading Teams*, McFee says she had a chance to present the Outdoor Classroom plans to her learning group. "I gained more confidence about how to communicate a plan to our national office, highlighting the benefits and outcomes to the organization. I (also) learned about staying focused, connecting with my own sense of values, and leading others with both purpose and passion."

The national office gave McFee the nod of approval to go ahead with the project.

McFee and her project team then secured additional partners in addition to Urban Systems, including WestJet. The tasks expanded, from creating a fundraising strategy to organizing volunteers.

"I learned about facilitating a new team that involved both

for nonprofit organizations to be competitive and successful you need to be innovative and mobilize every sector of society."

On October 3, 2008 McFee's shared vision became a reality and the CNIB Outdoor Classroom officially opened. The most memorable moment for McFee was watching several of the young children with vision loss engaged in play with the many components of the Outdoor Classroom.

"One very small child stood quietly – head bowed, eyes closed, tiny hands grasping onto the smooth xylophone bars – enjoying the calming vibrations of sound as his father delicately struck the instrument," McFee says.

McFee says she is grateful for the support she has received along her 10-year learning journey, one made possible thanks to the generosity of others. "It happened because of the Centre's scholarships for non-profit leaders and I want to express my gratitude and appreciation."

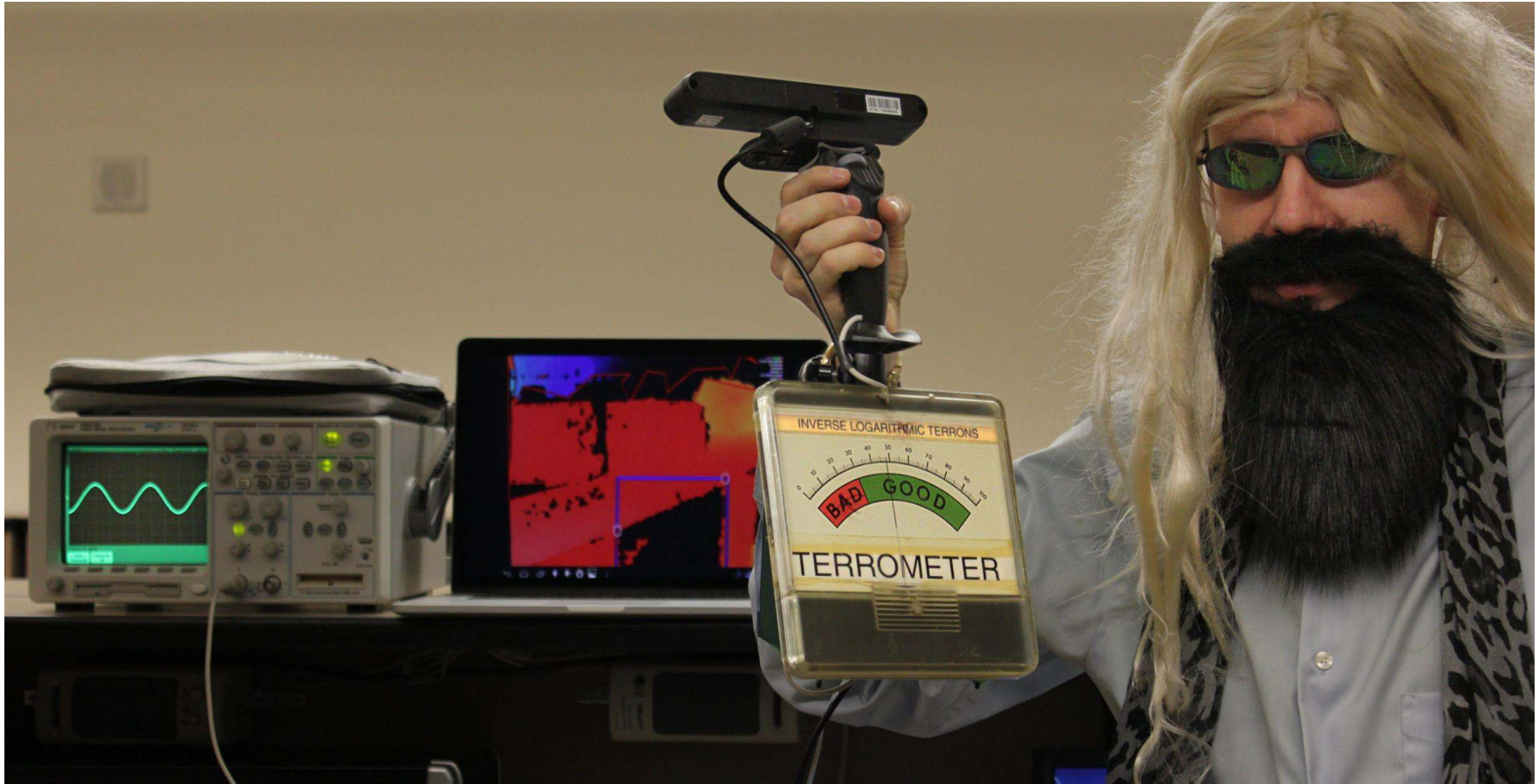
# INVERSE LOGARITHMIC TERRONS



# TERROMETER



## Pierre Bataille with Terrometer



Previously unpublished work...

Body of work: SeatSale, Griefcase, DECONference 2002, etc..



## Pierre Bataille with Terrometer



## Conclusions: "Treesign"

- Both rhizomic AND deeply-rooted;
- A "Forest" of Treesigners!
- Create new fields or new BRANCHES of existing fields...
- Centre for Nature+Tech.+Health; Join me in grantwriting...

For more information, see: <http://eyetap.org/publications/>

- WearComp: [http://www.interaction-design.org/encyclopedia/wearable\\_computing.html](http://www.interaction-design.org/encyclopedia/wearable_computing.html)
- Spaceglasses: [spaceglasses.com](http://spaceglasses.com)