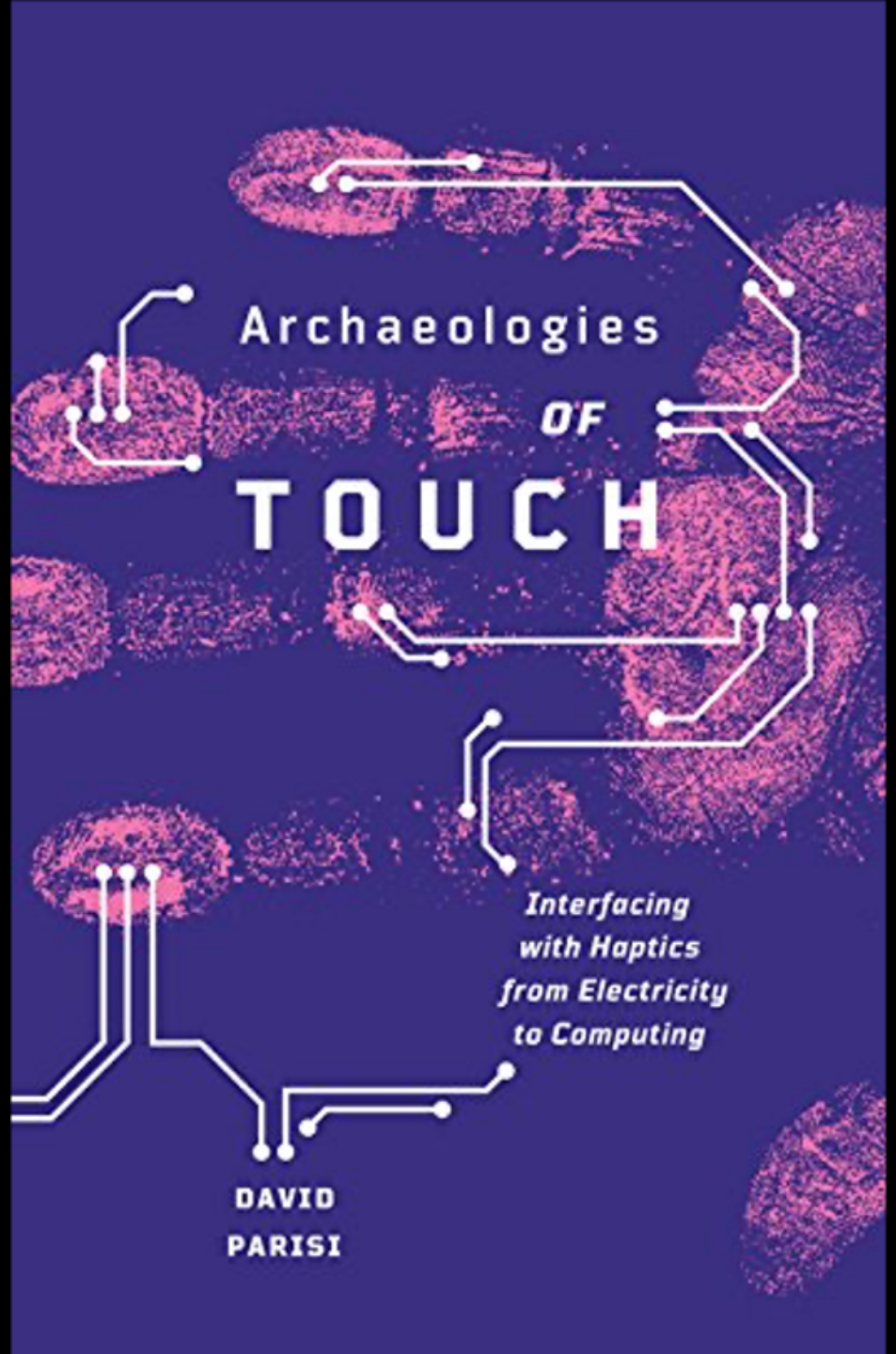
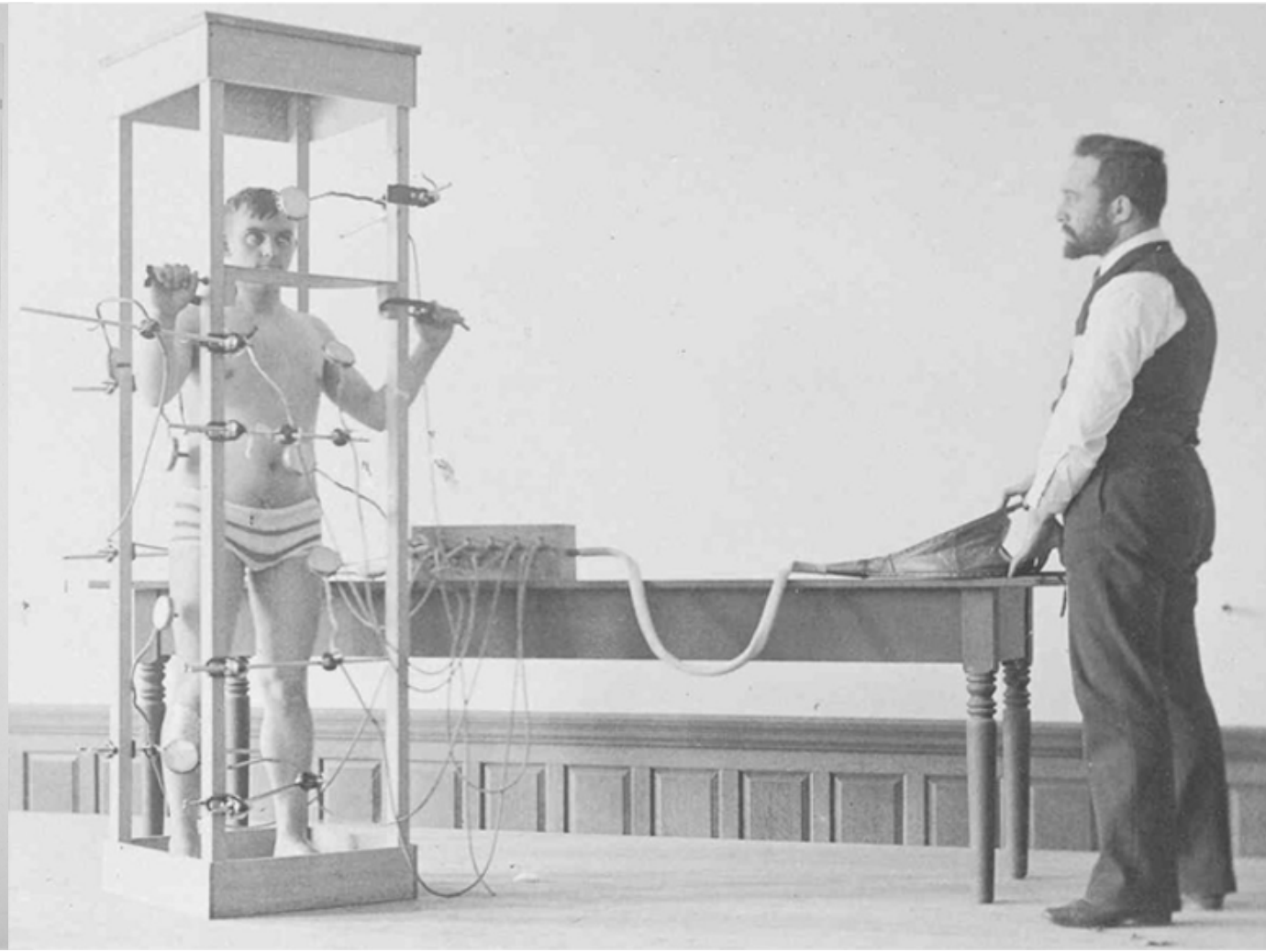
Mapping Touch through Affective Haptics

David Parisi
Associate Professor
College of Charleston
parisid@cofc.edu
@Dave_Parisi


Archaeologies
OF
TOUCH
Interfacing
with Haptics
from Electricity
to Computing
DAVID
PARISI

Early electrical experiments (c. 1740)



Haptics Experiments at Clark University (1890s)

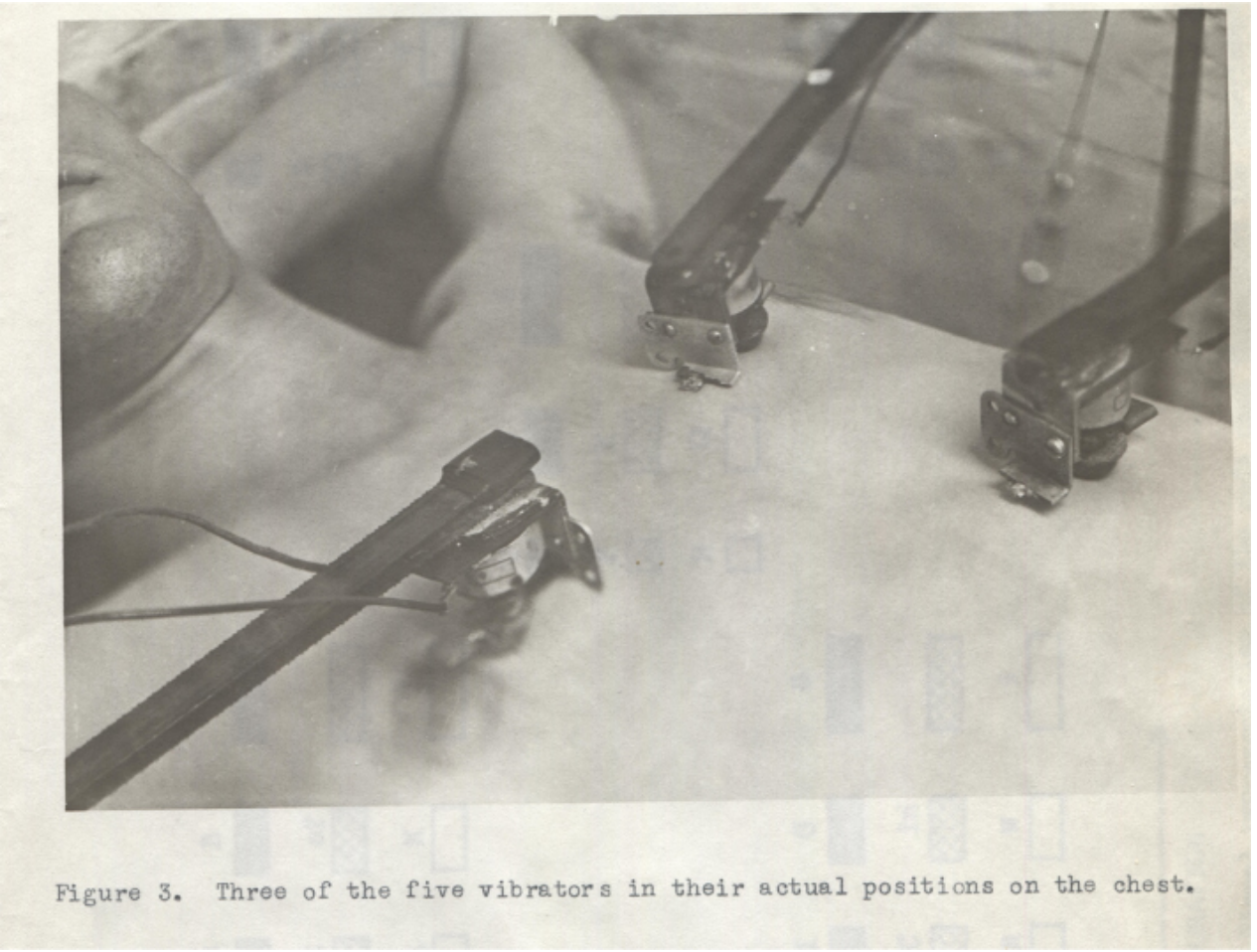
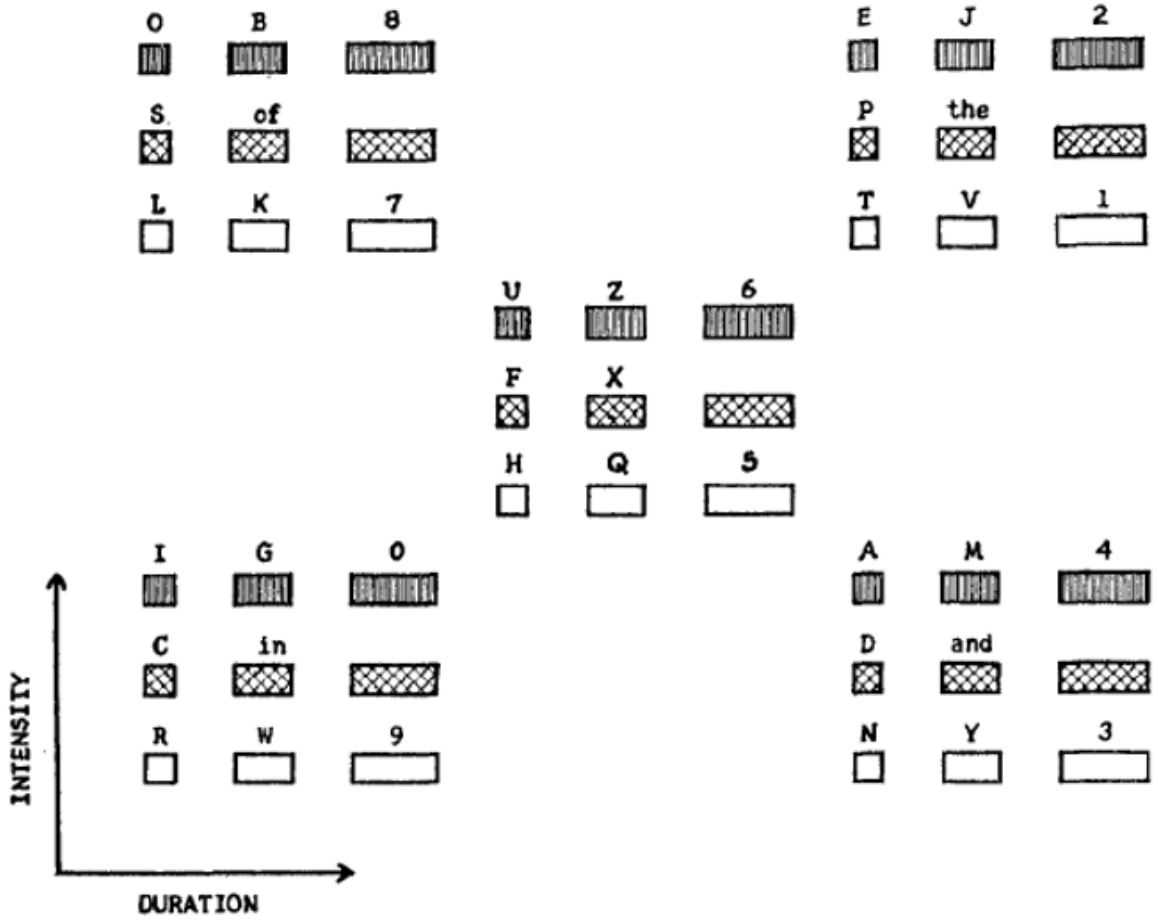


Figure 3. Three of the five vibrators in their actual positions on the chest.



Vibratese Apparatus and Coding Scheme (1950s)

Comput. & Graphics, Vol. 2, pp. 95–103. Pergamon Press, 1977. Printed in Great Britain

COMPUTING WITH FEELING

WILLIAM D. ATKINSON,† KAREN E. BOND, GUY L. TRIBBLE, III‡ and KENT R. WILSON
University of California, San Diego, Department of Chemistry, La Jolla, CA 92093, U.S.A.

(Received 20 January 1976)

Abstract—Computers are usually considered as manipulators of numbers, words and symbols: machines with which we communicate visually by printers, plotters and displays, and sometimes audibly through music synthesis and speech recognition. We are engaged in a project involving touch communication with computers in order to broaden computer graphics capability. Originally pioneered by Noll and by Batter and Brooks, touch communication with computers can link together brain, hands and computer to explore new worlds of felt imagery, worlds existing only in computer memory.

Humans are distinguished from other animals particularly by two things: the hands, which allow fine manipulations of objects in the environment, and the brain, which permits thought. Touch communication with computers employs both of these most human capabilities. What we're searching for is a closer symbiosis between humans and machines, a partnership of two unlike species growing together as both learn to perform joint tasks better. This symbiosis demands a better interface where machine meets person.

The first of our touch communication systems is a three-dimensional force–position system called "Touchy Feely" in which mechanical simplicity is gained by using a tetrahedral coordinate system, employing the computer to transform into other coordinate systems. We are also designing a force, torque, position and orientation system, "Touchy Twisty", which will permit the user to feel the docking of one three-dimensional object with another: in other words, to allow the assembly of computer simulated objects.

There are many applications of human–computer touch communication to research and learning, extending into such areas as computer science, engineering design, chemistry, physics, biology, medicine, psychology, art, and insight for the blind. With touch communication we can feel things never felt or seen before and perceive spatial relationships not otherwise possible. We can thereby create a more sensitive awareness and understanding of natural phenomena in three-dimensional space, phenomena involving forces and torques for which visual representation is often inappropriate or impossible.

1. INTRODUCTION

Touch is now only a proximate sense [1]; we can perceive objects or forms by touch only if we are directly in contact with them. Thus we are restricted to sensing objects which share the general size range of our bodies, which exist in time long enough for humans to perceive them, and which, if we are wise, are non-injurious. Touch communication mediated by touch interface and computer can remove all these limitations, expanding our touch horizons beyond present limits.

How can we best implement touch communication with computers? We are exploring two directions. The first, "Touchy Feely", follows the path laid out by Batter & Brooks and by Noll[2–4] of force as a function of position; in other words, a point interacting with an environment. We have been able to simplify the construction by choosing a coordinate system based on mechanical simplicity and then allowing the computer to handle the transformation to coordinates more compatible with our human experience. The second system, "Touchy Twisty", which has already been roughly designed and the concepts partially tested, implements torque and force as functions of orientation and position; in other words, a 3-D object interacting with a 3-D environment.

2. FORCE AND POSITION: "TOUCHY FEELY"

(A) *Overview*

The structure of our first touch communication device is a tetrahedron with shaft encoders and torque motors at each of the four vertices as shown in Figs. 1 and 2. Attached to the shaft of each motor is a takeup drum for a steel cable tied to a small ball at the center of the tetrahedron. The operator grasps the ball ("Touchstone") and controls its position within the tetrahedron, while the computer controls the force on the ball via the torques on the four motors.

Four optical shaft encoders, one for each shaft motor, keep track of the position of the Touchstone in space. At any given moment the number in each bi-directional counter fed by encoder pulses is proportional to the difference between the length of the corresponding cable

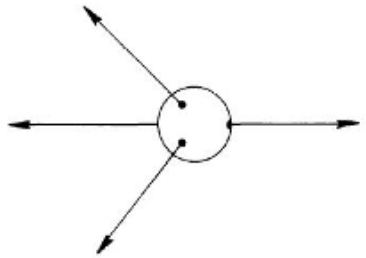


Fig. 1.

†Present address: Departments of Physiology & Psychology, University of Washington, Seattle, WA 98195, U.S.A.
‡Present address: School of Medicine, University of Washington, Seattle, WA 98195, U.S.A.

Pergamon

Comput. & Graphics, Vol. 21, No. 4, pp. 393–404, 1997

Printed in Great Britain
0097-8493/97 $17.00 + 0.00

PII: S0097-8493(97)00030-7

Haptic Displays in Virtual Environments

HAPTICS IN VIRTUAL ENVIRONMENTS: TAXONOMY, RESEARCH STATUS, AND CHALLENGES

MANDAYAM A. SRINIVASAN[1,2†] and CAGATAY BASDOGAN[1,2]

[1]Laboratory for Human and Machine Haptics, Department of Mechanical Engineering, 36–769, Massachusetts Institute of Technology, Cambridge, MA 02139, U.S.A.
e-mail: srini@mit.edu
[2]Laboratory for Human and Machine Haptics, Research Laboratory of Electronics, 36–769, Massachusetts Institute of Technology, Cambridge, MA 02139, U.S.A.

Abstract—Haptic displays are emerging as effective interaction aids for improving the realism of virtual worlds. Being able to touch, feel, and manipulate objects in virtual environments has a large number of exciting applications. The underlying technology, both in terms of electromechanical hardware and computer software, is becoming mature and has opened up novel and interesting research areas. In this paper, we clarify the terminology of human and machine haptics and provide a brief overview of the progress recently achieved in these fields, based on our investigations as well as other studies. We describe the major advances in a new discipline, *Computer Haptics* (analogous to computer graphics), that is concerned with the techniques and processes associated with generating and displaying haptic stimuli to the human user. We also summarize the issues and some of our results in integrating haptics into multimodal and distributed virtual environments, and speculate on the challenges for the future. © 1997 Elsevier Science Ltd

1. INTRODUCTION

Haptics refers to manual interactions with environments, such as exploration for extraction of information about the environment or manipulation for modifying the environment. These interactions may be accomplished by human or machine hands and the environments can be real or virtual. Also, the interactions may or may not be accompanied by other sensory modalities such as vision and audition. Most of the virtual environments (VEs) built to date contain visual displays, primitive haptic devices such as trackers or gloves to monitor hand position, and spatialized sound displays. To realize the full promise of VEs, haptic displays with force and/or tactile feedback are essential. Being able to touch, feel, and manipulate objects in an environment, in addition to seeing (and hearing) them, provides a sense of immersion in the environment that is otherwise not possible. It is quite likely that much greater immersion in a VE can be achieved by the synchronous operation of even a simple haptic interface with a visual and auditory display, than by large improvements in, say, the fidelity of the visual display alone.

Exciting possibilities open up with the addition of haptics to various applications of virtual reality and teleoperation. Given below are some of the examples:

- *Medicine:* surgical simulators for medical training; manipulating micro and macro robots for minimally invasive surgery; remote diagnosis for telemedicine; aids for the disabled such as haptic interfaces for the blind.
- *Entertainment:* video games and simulators that enable the user to feel and manipulate virtual solids, fluids, tools, and avatars.
- *Education:* giving students the feel of phenomena at nano, macro, or astronomical scales; 'what if' scenarios for non-terrestrial physics; experiencing complex data sets.
- *Industry:* integration of haptics into CAD systems such that a designer can freely manipulate the mechanical components of an assembly in an immersive environment.
- *Graphic arts:* virtual art exhibits, concert rooms, and museums in which the user can log in remotely to play the musical instruments, and to touch and feel the haptic attributes of the displays; individual or co-operative virtual sculpturing across the Internet.

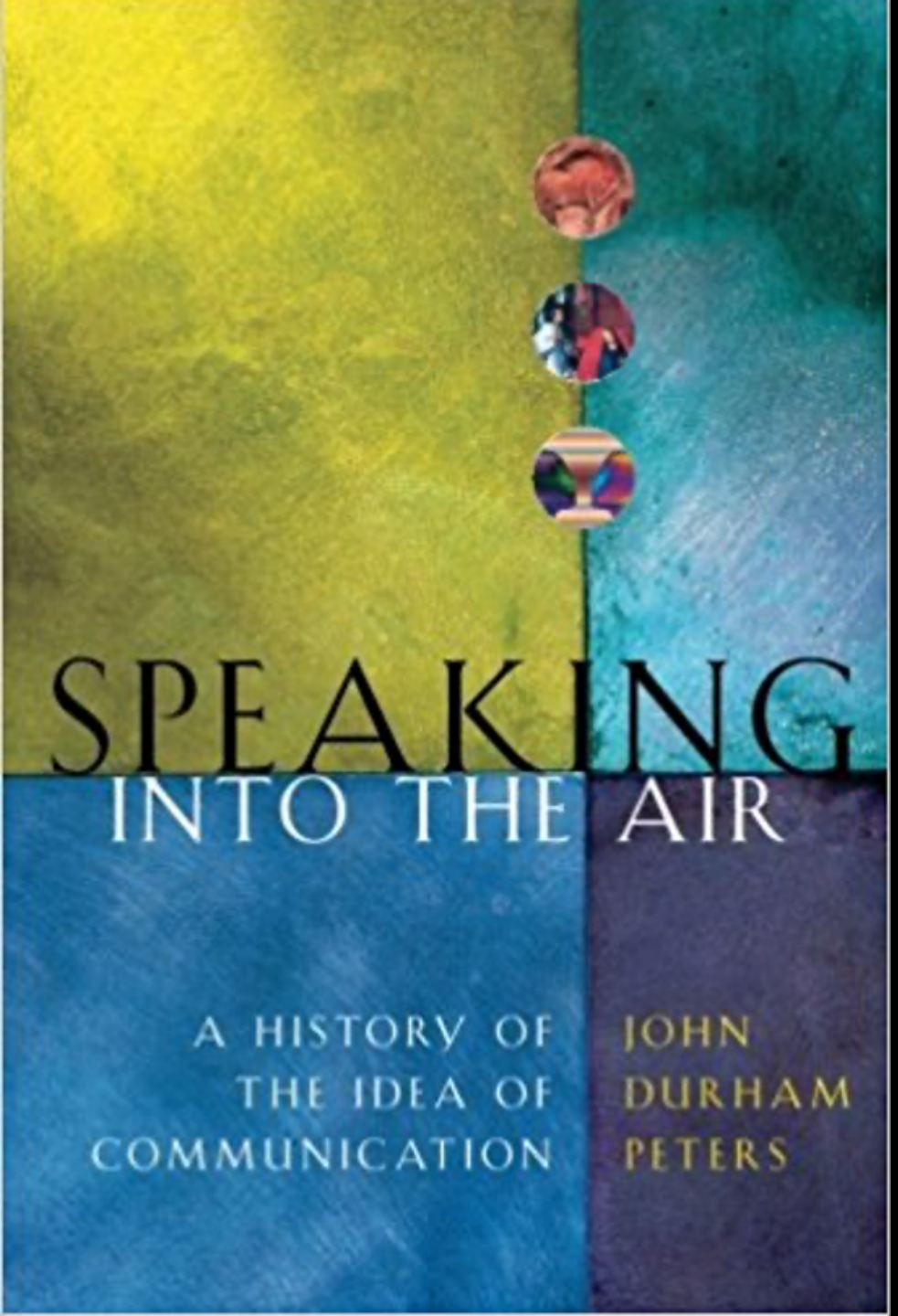
The subsystems and information flow underlying interactions between human users and force-reflecting haptic interfaces are shown in Fig. 1.

- *Human sensorimotor loop:* when a human user touches a real or virtual object, forces are imposed on the skin. The associated sensory information is conveyed to the brain and leads to perception. The motor commands issued by the brain activate the muscles and result in hand and arm motion. At our 'MIT Touch Lab', we have investigated various aspects of this sensorimotor process, such as the biomechanics of human finger pads, tactile

† Author for correspondence.

We found a way to give technology a more human touch. Literally.

It's called the Taptic Engine, a linear actuator inside Apple Watch that produces haptic feedback. In less technical terms, it taps you on the wrist. Whenever you receive an alert or notification, or perform a function like turning the Digital Crown or pressing down on the display, you feel a tactile sensation that's recognizably different for each kind of interaction. Combined with subtle audio cues from the specially engineered speaker driver, the Taptic Engine creates a discreet, sophisticated, and nuanced experience by engaging more of your senses. It also enables some entirely new, intimate ways for you to communicate with other Apple Watch wearers. You can get someone's attention with a gentle tap. Or even send something as personal as your heartbeat.



John Durham Peters on touch & mediation

- *Speaking into the Air* (1999)
- Touch:
"defies inscription"
- "remains stubbornly wed to the proximate"
- "has no remote capacity"
- "resists being made into a medium of recording and transmission."

ADVENTURES IN TACTILE LITERACY[1]

FRANK A. GELDARD
University of Virginia

THE human integument has been the object of precious little research effort on the part of psychologists. The reasons are not easy to ascertain, for the skin's vast significance in the behavioral economy is undeniable. Whether viewed as a boundary between the animate and inanimate—an interface in the dance of molecules—as an excretory organ normally yielding to the gaseous environment a kilogram or more of water vapor each day, as a regulatory mechanism preserving remarkable constancy of internal body temperature while adjusting to a prodigious range of external ones, or as a sensory surface—the locus of origin of an incessant barrage of neural spikes driving great portions of our muscular and glandular systems into forced action, the importance of the cutaneous mechanism is self-evident. It is in connection with the last role, that of receiving surface for several different forms of energy—mechanical, thermal, electrical, and chemical—that the efforts of experimental psychologists are most profitably invested in the integument. My purpose today is to assist the skin, as receiver and transducer of these multiform energies, in capturing your interest, at least transiently.

We so habitually think of communication as a function to be mediated by eyes and ears that the existence of other potential channels tends to escape us. There is nearly universal dependence on vision and audition in all important affairs of human existence—in business and industry, on the highway, in sports and recreational activities, in the scientific laboratory, in the operation of military equipment, indeed, in practically all our comings and goings. Because the eye can make the finest of discriminations there is a natural tendency to put it to work in all situations requiring accurate encoding, transmission, and receipt of information. Because the ears are always "open," so to speak, because they are always available even though their owner may be preoccupied, urgent messages are likely to be cast in auditory form. Indeed, our eyes and ears are assaulted so continuously, such frequent and insistent demands are placed on them, that the visual and auditory channels are seriously overburdened at times. Such oversaturation leads quite naturally to the question of whether it is only vision and hearing that can serve in communication. By traditional count we have three other sensory channels, and by less rigorous but more sophisticated reckoning we have a score or so of them available. What are the chances that one or more of the less well-developed modalities could serve efficiently in a communication network?

Any of them can serve—after a fashion. It is possible to transmit intelligence successfully by any of the sense avenues, including the ponderous chemical senses, for instance, by suitable utilization of International Morse code. A skilled receiver can get meanings just as promptly and accurately by feeling dots and dashes as by listening to them. It would be possible to tap out Morse with spaced suffusions of salt on the tongue, with differently sized packages of radiant heat on the forehead, or even by a series of injections of acids at some not too inconvenient spot on the integument, though the phrase "tap out" would seem to be something of a euphemism here. In consideration of their respective utilization times, the delays in buildup of sensation, and the times needed for sensory decay following the removal of the stimulus, a rough estimate of the total time required to transmit, in International Morse, the uninspired but well-standardized message, "Now is the time for all good men to come to the aid of the party," comes to a little over a half hour, for spaced suffusions of salt on the tongue; about an hour or so, for packages of radiant heat on the forehead (assuming the aid of a cooling system to keep down the blisters); and the better part of a day, for acid injections in the skin, also assuming the assistance of a suitable counterirritant to hold tissue pH within bounds. There are not many sensory systems that do well with time. The chemical senses, mainly by accident of

[1] Address of the retiring President, Division of Experimental Psychology, delivered at Chicago, Illinois, September 3, 1956. The experimental work reported herein was supported by the Office of Naval Research.

"Our eyes and our ears are assaulted so continuously, such frequent and insistent demands are placed on them, that the visual and auditory channels are seriously overburdened at times. Such oversaturation leads quite naturally to the question of whether it is only vision and hearing that can serve in communication."

-Geldard,

"Adventures in Tactile Literacy"

The Electric Sailor (1910)

Spear the Dragon (1929)

"A jolting new force in gameplay. Take the new Dual Analog Controller for a spin. It's a totally intensified experience where you'll feel the sweet purring of your engine, the shuddering crash of another car into yours, or the tires skidding out across the track. Just make sure you fasten your seatbelt."

Haptics technologies are a response by their designers to social problems

The cultural history of touch technologies suggests an openness to communication by artificial haptic stimuli

Health

No hugging: are we living through a crisis of touch?

Paula Cocozza
@CocozzaPaula
Wed 7 Mar 2018 14.46 GMT

"You just don't see people touching each other these days," Field complains. She has just come from a restaurant. "And everybody was on their cellphones." At LaGuardia airport recently, she walked around the waiting area. "Not a soul was touching another. Even two-year-olds were sitting in carriages with iPads on their laps." (Getting touch from their touch screens.) Then, at the Coconut Grove art festival, "There were people bumping into each other because it was so packed. I heard people say, 'I'm sorry! Excuse me!' and move off in a way that made it look like they were really embarrassed."

Field is planning studies in restaurants and airports "to document how little touch there is and how much distraction by social media". There is as yet no scientific data to connect declining touch to the rise of mobile technology or social media, but Field's descriptions of people wrapped in their own worlds rather than each other, sitting in isolation, bowed over screens, a huddle unto themselves, are evocative and familiar.

THE STONE

Losing Our Touch

BY RICHARD KEARNEY AUGUST 30, 2014 11:30 AM 147

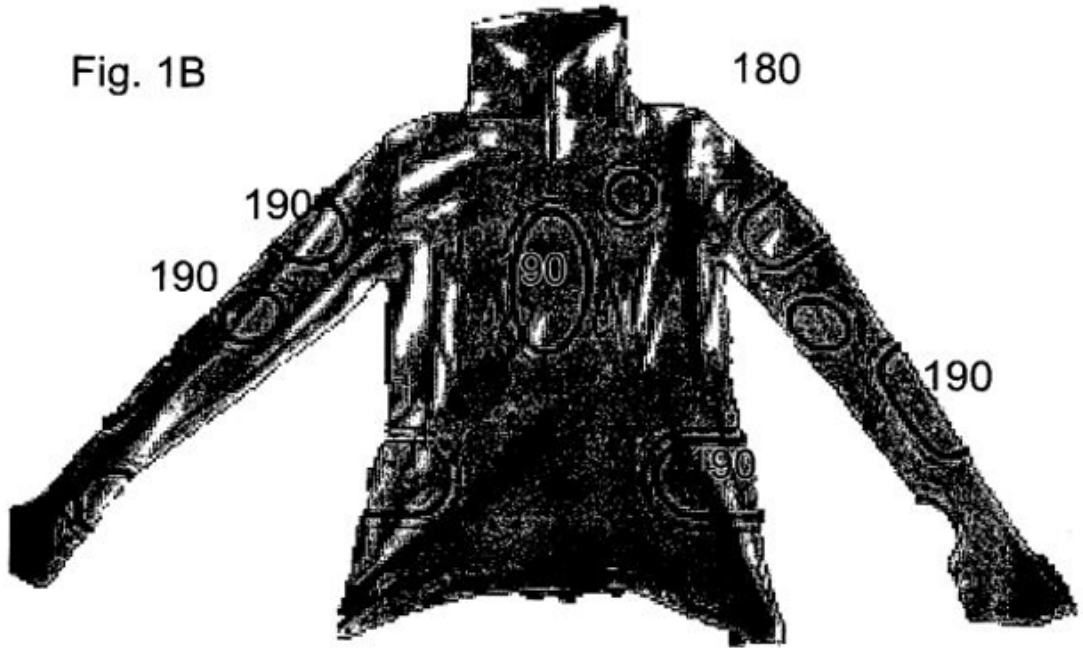
The Stone is a forum for contemporary philosophers and other thinkers on issues both timely and timeless.

Are we losing our senses? In our increasingly virtual world, are we losing touch with the sense of touch itself? And if so, so what?

I recently had occasion to pose these questions to students in a college class I teach on eros — "from Plato to today." Not surprisingly, the topic of physical contact and sex came up, and the conversation turned very much to "today." A number of the students said that they regularly messaged online before having "real contact" with partners, perhaps using online dating and mating services like Match.com, OkCupid, SpeedDate.com and Tinder. They shared messaging acronyms that signaled their level of willingness to have sex, and under what conditions. They admitted to enjoying the relative anonymity of the one-off "hook up," whose consummation required no preliminary close-quarters courtship rites or flirtation ceremonies, no culinary seduction, no caress, nothing — apart from the eventual "blind rut," as James Joyce put it — requiring the presence of a functioning, sensitive body.

We noted the rather obvious paradox: The ostensible immediacy of sexual contact was in fact mediated digitally. And it was also noted that what is often thought of as a "materialist" culture was arguably the most "immaterialist" culture imaginable — vicarious, by proxy, and often voyeuristic.

Fig. 1B



Huggy Pajama: A Mobile Parent and Child Hugging Communication System

James Keng Soon Teh
Mixed Reality Lab,
National University Singapore

Adrian David Cheok
Mixed Reality Lab,
National University Singapore

Roshan L. Peiris
Mixed Reality Lab,
National University Singapore

Yongsoon Choi
Mixed Reality Lab,
National University Singapore

Vuong Thuong
Mixed Reality Lab,
National University Singapore

Sha Lai
Mixed Reality Lab,
National University Singapore

ABSTRACT

Huggy Pajama is a novel wearable system aimed at promoting physical interaction in remote communication between parent and child. This system enables parents and children to hug one another through a novel hugging interface device and a wearable, hug reproducing pajama connected through the Internet. The hugging device is a small, mobile doll with an embedded pressure sensing circuit that is able to accurately sense varying levels of the range of human force produced from natural touch. This device sends hug signals to a haptic jacket that simulates the feeling of being hugged to the wearer. It features air pockets actuating to reproduce hug, heating elements to produce warmth that accompanies hug, and color changing pattern and accessory to indicate distance of separation and communicate expressions. In this paper, we present the system design of Huggy Pajama.

Categories and Subject Descriptors

H.5.2 [**Information Interfaces And Presentation (e.g.,HCI)**]: User Interfaces—*Haptic I/O, interaction styles*

1. INTRODUCTION

In today's modern urban lifestyle and global 24/7 economy, working parents are constantly kept apart from their children at home by heavy over work and business trips. It is ironic that while the purpose of work is to enable parents to provide for their loved ones, they have to sacrifice too much time with their loved ones as a result. Children are left at home, while parents are constantly balancing between work and worrying about the well being of their children. The uncontrolled development of society due to this vicious cycle can result in feelings of isolation, loneliness and a lack of sense of value [13]. Therefore there is a strong need for loved ones to constantly keep in touch, and express affections to one another. In certain scenarios, actions do speak louder than words.

This problem is more pronounced for parents with young children. Children of these young ages need a lot of care, guidance and love [7]. Parents are generally able to reach their children by telephone or video phone, but communication purely by voice or video lacks the physical interaction which has been shown in previous research to be vital in effective communication [1]. Younger children might have difficulties understanding the true meaning of words spoken by their parents. As a consequence, we require a more effective way of remote communication between parents and young children. While it may not always be possible for parents to decline work commitments (such as long office hours and business trips) to spend time with their children, remote haptic interaction may be a feasible alternative when the parent must be away from the home. Although never intended to replace real physical hugging, we believe this system would be of great benefit for times when the parent and child cannot be at the same place. A very related scientific proof showed that infant monkeys grew up healthily when artificial contact comfort was given even in the total absence of their real mothers (although it would be unethical to carry out the same tests to deprive human infants artificially) [5].

In this paper, we present a novel type of physical interaction system for parents and children interaction through the Internet. Huggy Pajama is a mobile and wearable human-computer-human interaction system that allows users to send and receive touch and hug interactions.

Huggy Pajama consists of two physical entities. On one end, we have a novel hugging interface in the form of a small and mobile doll with embedded touch and pressure sensing circuits. It is connected via the Internet to a haptic wearable pajama with embedded air pockets, heating elements and color changing fabric. A general overview of the system is shown in Figure 1. On the left of the figure, we have an input device which acts as a cute interface that allows parents to hug their child and send mood expressions to them. On the right side of the figure, connected through the Internet, we have air actuating module and color cloth changing expressive interfaces to reproduce hug and connect parent and child. This pajama is able to simulate hugs to the wearer

IDC '08, June 11-13, 2008 Chicago, IL, USA

Figure 17: Huggy Pajama system overview

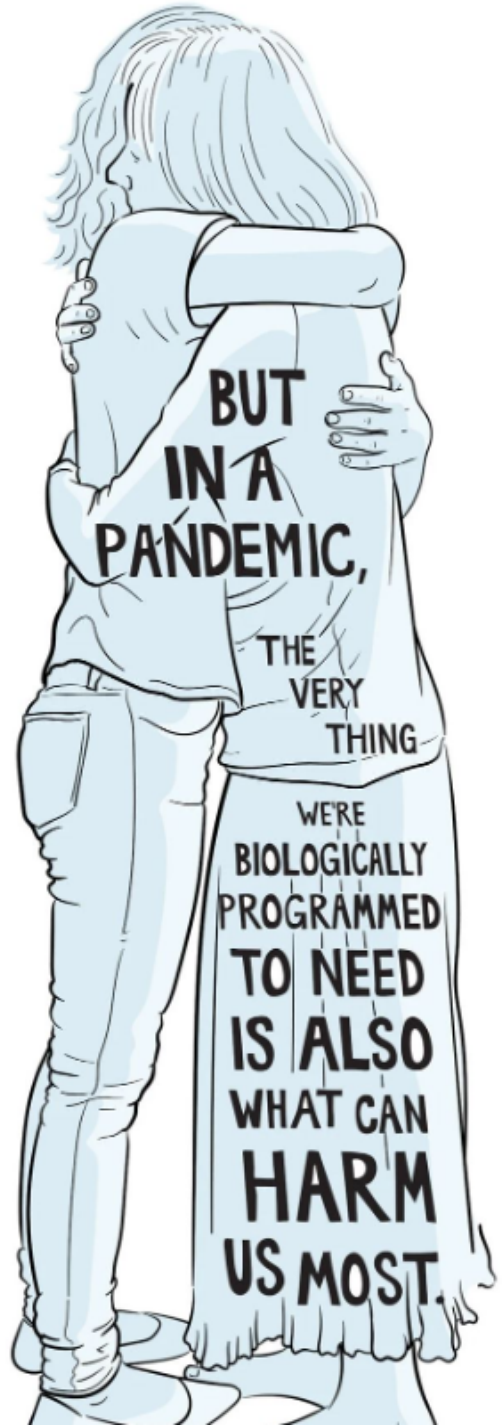
Opinion

Op-Art: What Do We Lose When We Stop Touching Each Other?

The thing we are biologically programmed to need is also what can harm us most.

By Kristen Radtke
Ms. Radtke is an author and an illustrator.

March 19, 2020



OPINION MARCH 22 2020 - 4:30AM

A dire case of 'skin hunger' hits hard in self-isolation

Steve Evans Latest News

Coronavirus Has Killed the Power of Touch. How Do We Reconnect?

SKIN DEEP

Coronavirus is accelerating a culture of no touching – here's why that's a problem

March 16, 2020 11.01am EDT

No more hugs? Rawpixel.com/shutterstock

Email
Twitter 23
Facebook 569
LinkedIn
Print

Touch has profound benefits for human beings. But over the last few decades, people have become increasingly cautious about socially touching others for a range of reasons. With the novel coronavirus spreading, this is bound to get worse. People have already started avoiding shaking hands. And the British queen was seen wearing gloves as a precaution not to contract the virus.

In Touch: "Media Tales of Touch During Covid"
https://in-touch-digital.com/2020/04/23/media-tales-of-touch-during-covid/

Best Inventions of 2006

It's been an interesting year in technology. Nintendo invented a video game you control with a magic wand. A new kind of car traveled 3,145 miles on a single gallon of gas. A robot learned to ride a bike and somebody came up with a nanofabric umbrella that doesn't stay wet

CLOTHING

Amazing Embrace

22 of 42
VIEW ALL

Remember when PDA stood for something other than personal digital assistant? It can again with the Hug Shirt, a high-tech garment that simulates the experience of being embraced by a loved one. When a friend sends you a virtual hug, your cell phone notifies the shirt wirelessly, via Bluetooth. The shirt then re-creates that person's distinctive cuddle, replicating his or her warmth, pressure, duration and even heartbeat. And, yes, the Hug Shirt is fully washable.

Loreffrey for TIME

Inventor: CuteCircuit
Availability: Not yet for sale
To learn more visit cutecircuit.com

NEXT The Doting Dinosaur

Hug Shirt

The Hug Shirt, developed by Cute Circuits, allows you to feel the physical closeness of a distant loved one by generating the sensation of being hugged. How is this possible?

Embedded sensors and electronics in the shirt are able to pick up signals such as a heartbeat and body temperature from a loved one at the other end of a mobile phone. When the sensors process the signal, embedded mechanisms in the shirt re-create the physical pressure and warmth of a real hug. AD

Feeling lonely this Valentine's Day? Try a remote hug

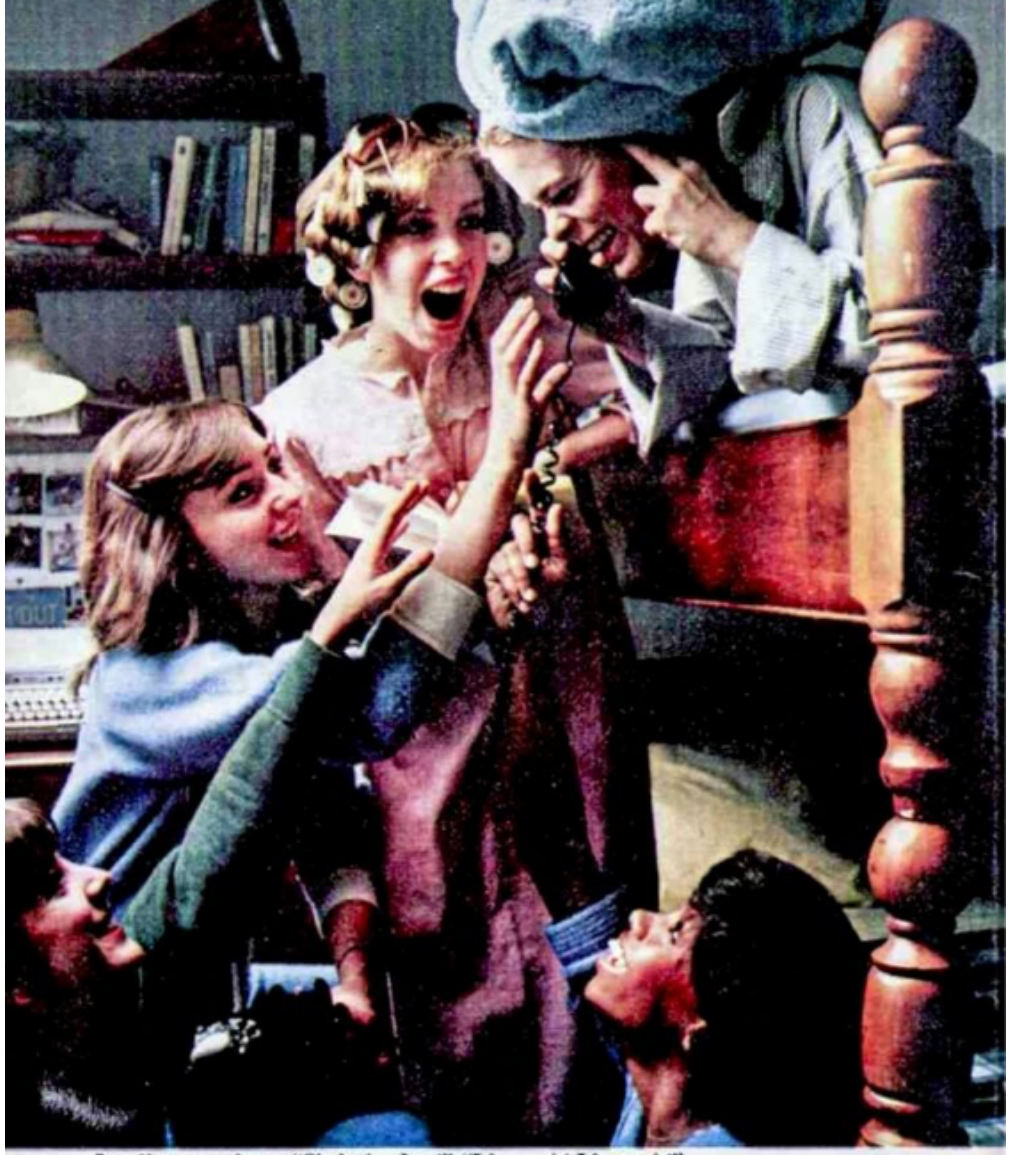
By Adi Robertson | @thedextriarchy | Feb 14, 2017, 10:12am EST

If there is one thing we know about the average Complex reader, it is that they feel lonely and unloved. We're just kidding, that's all people, not just Complex readers. If the years of therapy and nights of boozing aren't curing the inescapable feeling that you are alone in this cold, cruel world, then it might be time for you to buy a Hug Shirt. "The Hug Shirt™ is a shirt that makes people send hugs over distance," at least that's what CuteCircuit's website tells us. The HugShirt is bluetooth enabled, allowing you to send "hugs" to the wearer from anywhere in the world. Rather than texting a filthy emoji, why not start off your next sexting session with a high-tech hug? Other than the fact that it looks like these are not on the market, they promise to be prohibitively expensive, and that the concept is ridiculous, we can't think of a reason not to get your hands on one of these.

Feel the Music

CuteCircuit SoundShirt

Courtesy



Just listen to them. "She's the first!" "I knew it! I knew it!" "Have they set the date?" You want to tell the world. But first you have to share it with the gang. You've shared perfume and clothes, secrets and dreams—the silly and the serious. And this is serious. There it is, bigger than life, on the third finger of your left hand. Reach out to faraway family and friends. Big news or just a "hello," they love hearing from you.

Bell System

Reach out and touch someone.

Reach out.
Reach out and touch someone.

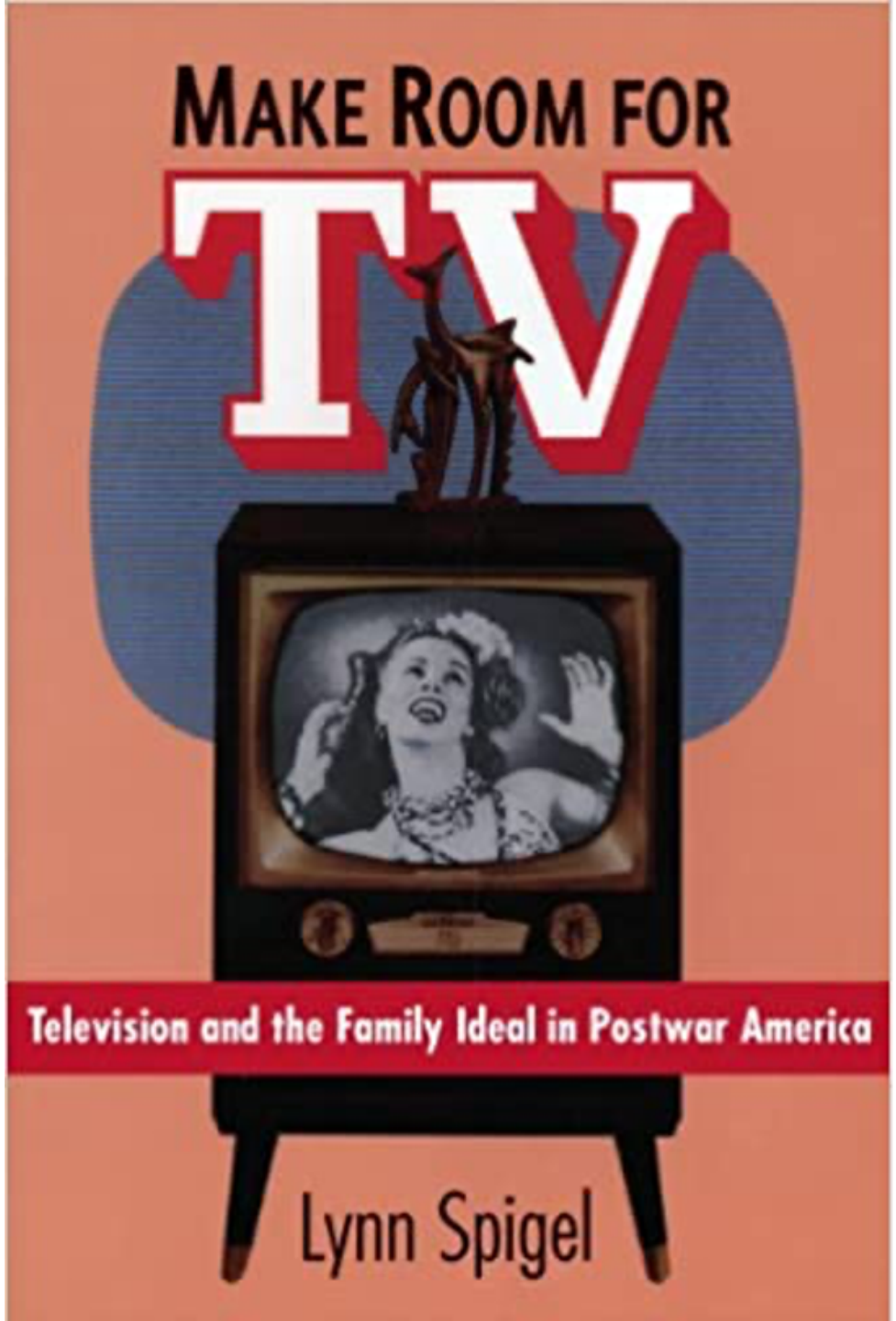
There's something really special about a grandmother's love. It communicates. Even to the grandchild she hasn't seen. No matter what she says, he understands. And even though he only gurgles back, his sounds have really made her day. Wonderful, isn't it, how a simple phone call can bring your family closer together. Reach out and touch someone who's waiting to share your day.

Bell System

Reach out.
Reach out and touch someone.

It's the happy of a phone call from far away. Whatever you say, you're never too far to reach out and share a bit of yourself with someone who's waiting for your call. A phone call makes you both feel good. Call someone because you care, even if it's just to say hi. So reach out. Reach out and keep close with farmers family and friends. Long Distance call.

Bell System



"Telebugeye" afflicts the young in this cartoon from a 1950 issue of *Ladies' Home Journal*.

ABOUT THE SHOW

There's a revolution underway – a quiet revolution of the senses.

Technology is shifting from engaging just your eyes and ears to engaging your entire body. Embodied media and next-generation wireless networks, sometimes collectively called the Tactile Internet, will shift the fundamental relationship between humans and the technologies we invent. The transition of cyberspace from being virtual to being a physical place you can visit with all your senses is the biggest deal since... maybe since ever. Let's talk about it!

INIT is a different type of tech podcast. We get geeky, but we keep track of the human story. More than anything, INIT is about people – the people behind the tech, why they do what they do, and their vision of the future. We've all heard the adage, "the best way to predict the future is to invent it." INIT brings you conversations with the inventors of our shared future.

Who should listen to INIT?

- If you're a designer, maker, or developer, you'll learn how to make cool new experiences using new embodied technologies and immersive interfaces.
- If you're an artist, you might get inspired to use these new ideas to play with reality.
- If you're a student, you'll learn from others how you can build a career in immersive technology.
- If you're just curious about the future, you'll learn how immersive technology will impact all our lives in the coming decades.

No matter why you're here, listening to INIT means you're on the forefront of an emerging digital culture. I'm excited to be on this journey with you – we're all INIT together!

YOUR HOST

Dave Birnbaum

Touch

Previous / Next

Dreaming and Doing Haptics

David Parisi

April 26, 2020

Essay, 4.188 words

By examining two examples of haptic technologies – the Taptic Engine and the TESLASUIT – David Parisi asks how we should evaluate their utopian and transformative claims. Parisi also reflects on the potential dangers of these haptic devices: who has access to and control of the tactile data that haptic technologies capture, store, and transmit? What new violence will be inflicted against bodies? Whose touch will be extended into virtual worlds and over physical space, and whose bodies will be excluded from these haptic networks? This essay is part of the publication and research project of *Open!* about the sense of touch in the digital age.

Dreaming Haptics

For over thirty years, we have been waiting for the dream of haptics to come true. Popular press depictions of touch technologies, such as Howard Rheingold's 1991 book *Virtual Reality: The Revolutionary Technology of Computer-Generated Worlds*, have portrayed haptic devices as technologies of an imminent future that promise to liberate our repressed sense of touch from the shackles of audio-visual media. The inevitable arrival of haptics, we have been told, will usher in a new mode of interacting not just with computers, but also with other subjects in our communicative networks. According to haptics marketers and engineers, adding touch feedback to computers would make our interactions with them – and with each other – more natural, more holistic, and more engaging. Layering haptics onto existing audio-visual media systems, in this narrative, will not just be additive, but transformative, giving touch a new centrality in the configuration of the mediated sensorium, and allowing us to extend and amplify our sense of touch, just as these audio-visual media had previously extended our senses of seeing and hearing. Channelling a haptocentric humanist tradition that positions touch as both a vital and neglected experiential modality,[1] haptics proponents frame touch technology as a means of restoring contact with touch itself, a way to rediscover touch's power as an epistemic agent. In the dream of haptics, we can regain our lost humanity by seamlessly fusing with touch's technological extensions.

MARCH 31, 2020 9:00AM ET

Thanks to COVID-19, Internet-Connected Sex Toy Sales Are Booming

The field of teledildonics — essentially, "smart" vibrators — has never quite caught on. But could social distancing measures change that?

By EJ DICKSON

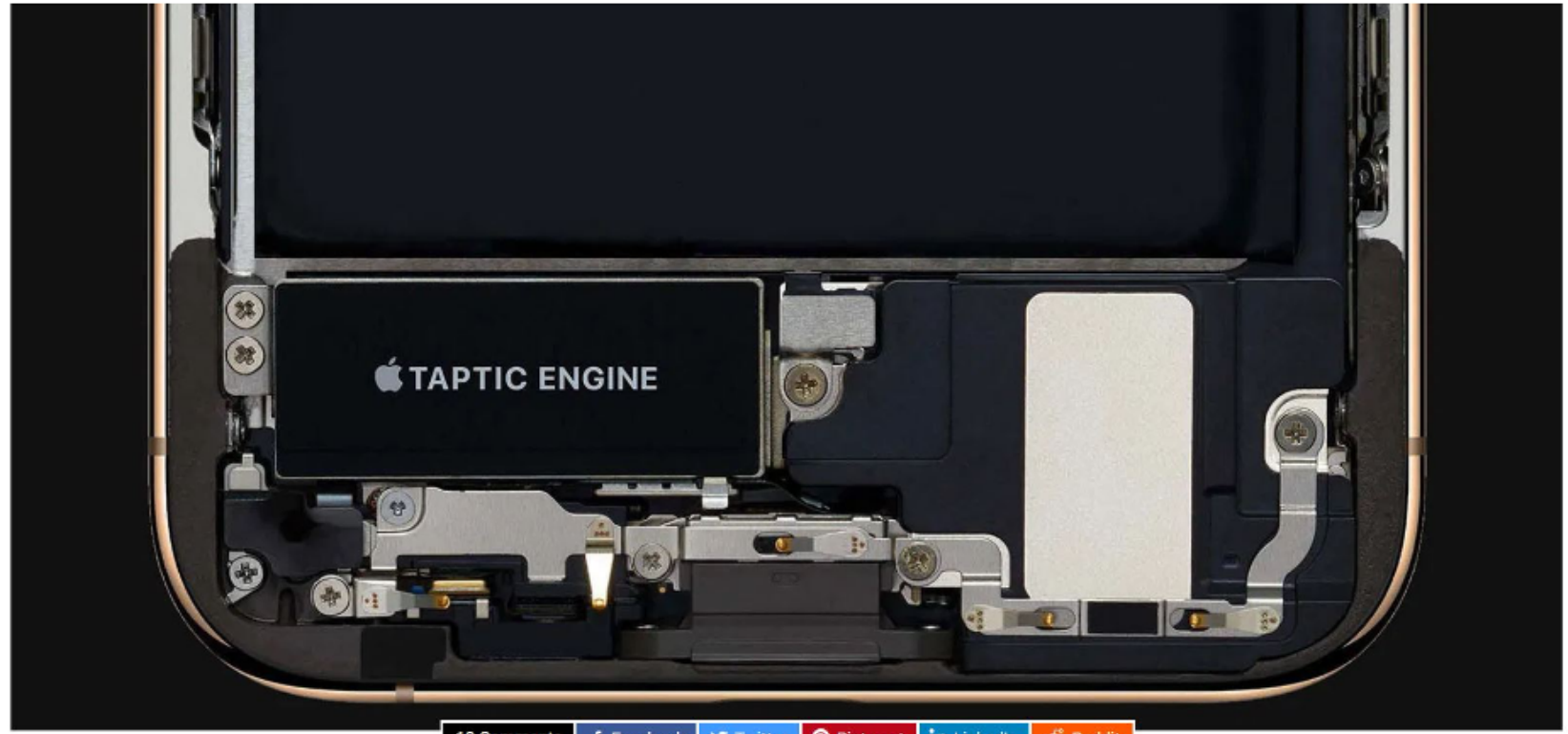
MIKE ANSALDO GEAR 06.20.2007 09:29 AM

"Vibranxiety" Afflicts Many Cellphone Users

Ever think your cell phone was vibrating and reach into your pocket to answer it only to find it wasn't vibrating at all? You're not alone according to a report in USA Today. The story examines the phenomenon of phantom cell phone vibration and posits explanations ranging from behavioral (your phone has trained you to [...]

Haptic overload continues as Instagram tests vibrating when you give a like

Ben Lovejoy - Dec. 4th 2019 4:40 am PT @benlovejoy



We get it, it's cool to be able to use the iPhone's taptic engine to simulate a button push. But it's now being overdone to such an extent that we're all suffering from haptic overload ...