# Text DB와 시청각 DB의 연계활용 방안에 대하여

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# Agenda

- 해외 신 기술 동향
  - 10 Emerging Technologies
  - IEEE 신 기술

- Text DB와 E-learning DB 연계 활용

# 10 Emerging Technologies 2010


## Real-Time Search

- 실시간으로 온라인상의 자료 검색 기술

## Mobile 3D

- 휴대기기에서 안경 없이도 입체 화면을 즐길 수 있는 기술

자료 : MIT 테크놀로지 리뷰



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# 10 Emerging Technologies 2010

## Solar Fuel

- 특수 식물을 활용해 디젤이나 에탄올 같은 연료 생성

## Social TV

- 온라인 커뮤니티와 TV를 결합하여 시청자가 함께 즐길 수 있도록 함


자료 : MIT 테크놀로지 리뷰

# 10 Emerging Technologies 2010

## Light-Trapping Photovoltaics

- 나노물질을 집광기에 입혀 집광 효율을 대폭 높임

## Cloud Programming

- 가상 공간에서 여러 사용자가 한꺼번에 이용 할 수 있는 프로그램

자료 : MIT 테크놀로지 리뷰



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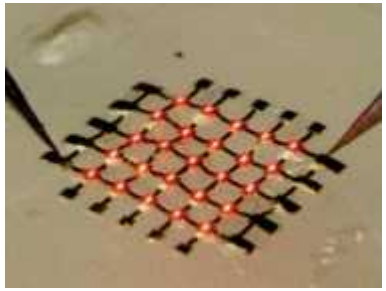
# 10 Emerging Technologies 2010

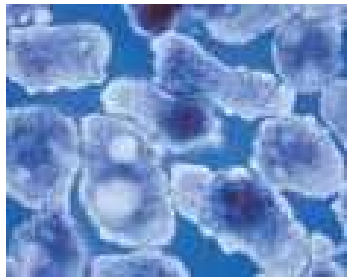


## Implantable Electronics

- 다양한 재료로 인체의 상태를 진단하는 칩을 제작하고 이식하는 기술

## Engineered Stem Cells

- 만능 줄기세포를 활용한 치료제 개발



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# 10 Emerging Technologies 2009

## Intelligent Software Assistant

- 인공지능 소프트웨어를 바탕으로 사용자가 원하는 맞춤형 정보를 인터넷으로 수집하여 제공해 주는 기술

## Hash Cache

- 자주 접속하는 웹 컨텐츠를 하드디스크에 저장하고 저장된 컨텐츠 접근 시 메모리의 사용량을 줄이는 기술

자료 : MIT 테크놀로지 리뷰

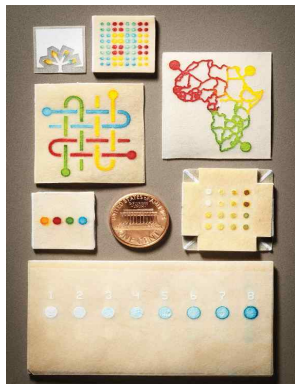
# 10 Emerging Technologies 2009

## Biological Machines

- 곤충에 MEMS기계들을 이식시킨 후 컴퓨터로 원격 조정하는 기술. 정찰용,수색-구조용,군사목적으로 사용 가능

## Paper Diagnostics

- 종이 위에 미세유체공학을 이용하여 채널 구조를 만들어 질병을 진단할 수 있는 1회용 칩을 개발하는 기술



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# 10 Emerging Technologies

- 10 Emerging Technologies는 대부분 IEL에 포함
- IEEE Conferences, Journals에 수록



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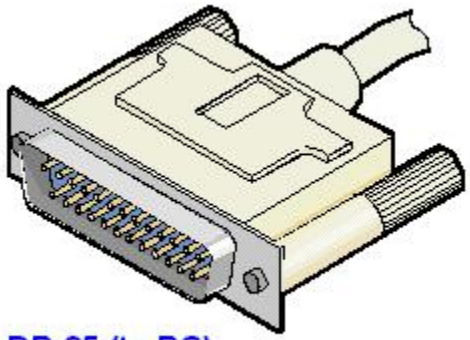
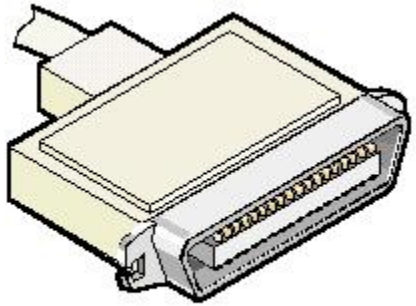
# IEEE Standards 1284

- 기존의 병렬 인터페이스(프린트 포트) 규격을 확장하여 100KB의 전송 속도를 2MB까지로 올리고 단방향이었던 통신 환경을 양방향으로 수정한 규격

- 양방향 모드를 사용함으로써 윈도우에서 프린터의 상태를 보다 쉽고 자세하게 알 수 있게 제공



DB-25 (to PC)



Centronics (to printer)

# IEEE Standards 1394

- 미국 애플사가 개발한 디지털 가전기기간 전송표준 기술
- 컴퓨터와 더 빠른 송수신을 하기 위해 만든 입출력 장치
- 기존의 케이블에 비해 훨씬 작고 간단함

# Bluetooth

- 1994년 에릭슨이 최초로 개발한 개인 근거리 무선 통신 기술
- 다양한 기기들이 안전하고 저렴한 비용으로 전세계적으로 이용할 수 있는 라디오 주파수를 이용해 서로 통신 할 수 있게 있게 함
- 블루투스는 USB를 대체 하는 개념
- IEEE 802.15.1규격을 사용

# IEEE Standards 802.11

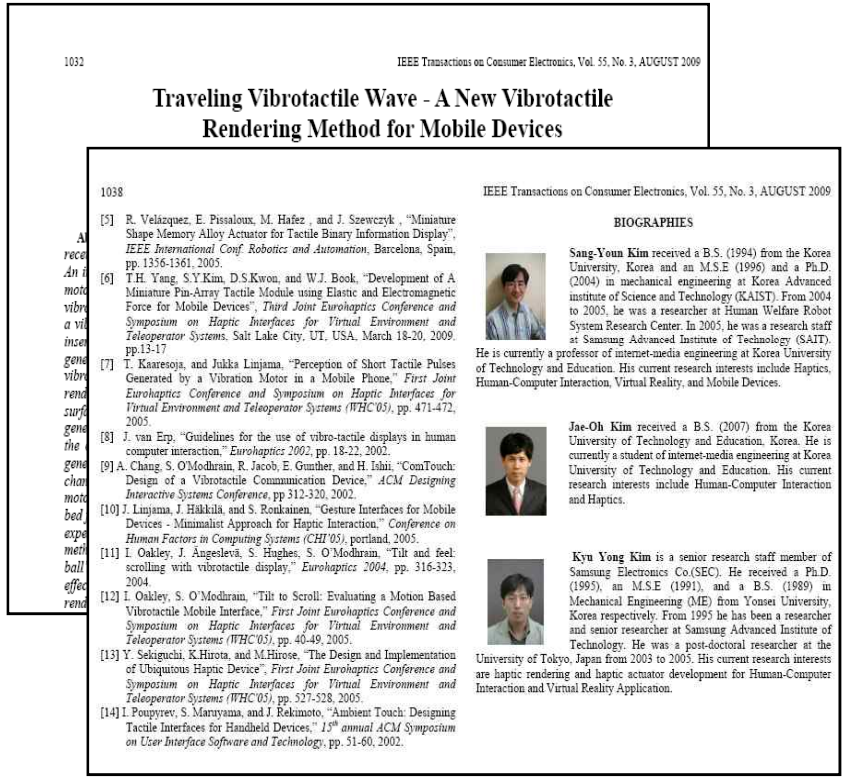
- IEEE 802.11은 흔히 무선랜, 와이파이(Wi-Fi)라고 부르는 좁은 지역을 위한 컴퓨터 무선 네트워크에 사용 되는 기술
- IEEE 802의 11번째 워킹 그룹에서 개발된 표준 기술을 의미
- IEEE 802.11은 현재 주로 쓰이는 유선 LAN형태인 이더넷의 단점을 보완하기 위해 고안된 기술
- IEEE 802.11b, IEEE 802.11n 규격이 널리 쓰이고 있슴

# IEEE Standards 802.15.3C

- 삼성전자에서 개발한 무선 전송 기술
- 2009년 11월에 IEEE 규격으로 승인
- 블루투스, 광랜 등에 비해 전송 속도가 최소 6~12배 빠름
- IEEE 규격 승인으로 무선 네트워크 시장에서 입지 강화

# IEEE Transaction on Consumer Electronics – Vibrotactile Traveling Wave

- 휴대폰 화면에서 그래픽 물체의 움직임까지 촉각적으로 느껴지게 하는 동적 햅틱 기술
- 한국기술교육대 김상연 교수 연구팀이 세계 최초로 개발



1032 IEEE Transactions on Consumer Electronics, Vol. 55, No. 3, AUGUST 2009

**Traveling Vibrotactile Wave - A New Vibrotactile Rendering Method for Mobile Devices**

1038 IEEE Transactions on Consumer Electronics, Vol. 55, No. 3, AUGUST 2009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**BIOGRAPHIES**



**Sang-Youn Kim** received a B.S. (1994) from the Korea University, Korea and an M.S.E (1996) and a Ph.D. (2004) in mechanical engineering at Korea Advanced institute of Science and Technology (KAIST). From 2004 to 2005, he was a researcher at Human Welfare Robot System Research Center. In 2005, he was a research staff at Samsung Advanced Institute of Technology (SAIT). He is currently a professor of internet-media engineering at Korea University of Technology and Education. His current research interests include Haptics, Human-Computer Interaction, Virtual Reality, and Mobile Devices.



**Jae-Oh Kim** received a B.S. (2007) from the Korea University of Technology and Education, Korea. He is currently a student of internet-media engineering at Korea University of Technology and Education. His current research interests include Human-Computer Interaction and Haptics.



**Kyu Yong Kim** is a senior research staff member of Samsung Electronics Co.(SEC). He received a Ph.D. (1995), an M.S.E (1991), and a B.S. (1989) in Mechanical Engineering (ME) from Yonsei University, Korea respectively. From 1995 he has been a researcher and senior researcher at Samsung Advanced Institute of Technology. He was a post-doctoral researcher at the University of Tokyo, Japan from 2003 to 2005. His current research interests are haptic rendering and haptic actuator development for Human-Computer Interaction and Virtual Reality Application.



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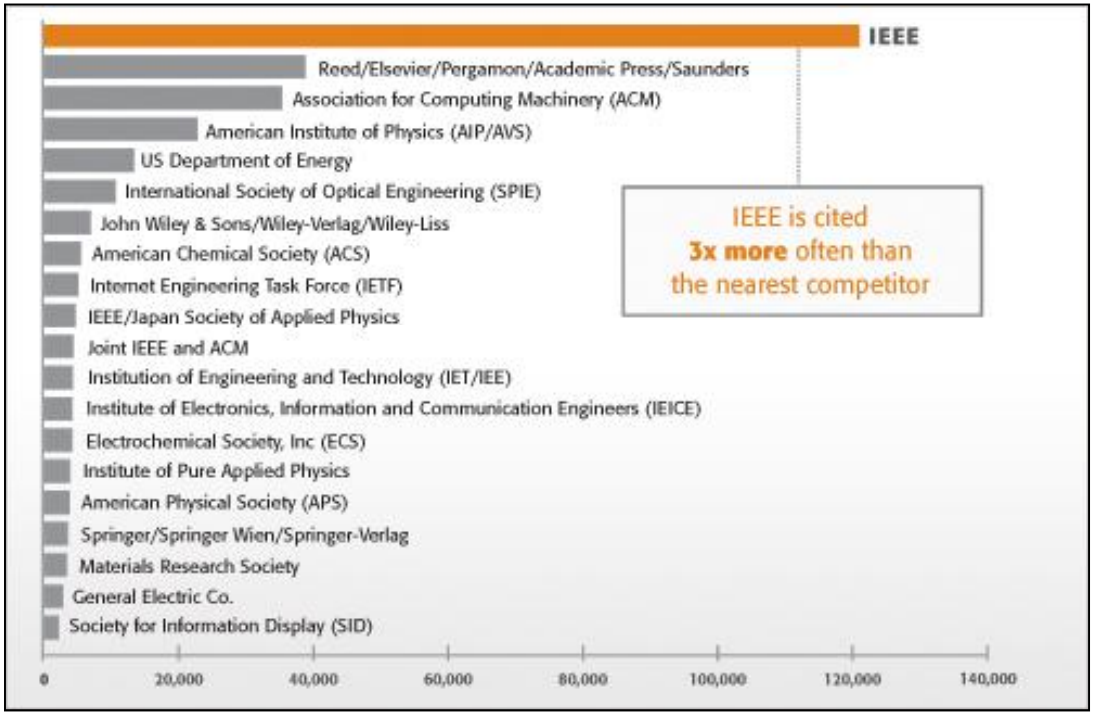


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- 약 160개국의 370,000명 이상의 회원을 가진 기술 전문 학회
- Five core areas of activity
  - Publishing
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  - Standards
  - Membership
  - Education

# IEEE Members


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2000

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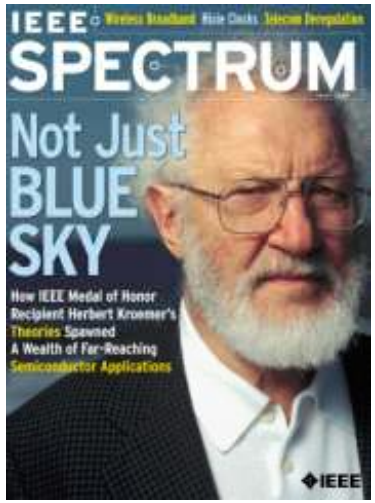


## Herbert Kroemer
IEEE Medal of Honor
2002

2000년 노벨 물리학상 수상
(복합 반도체)


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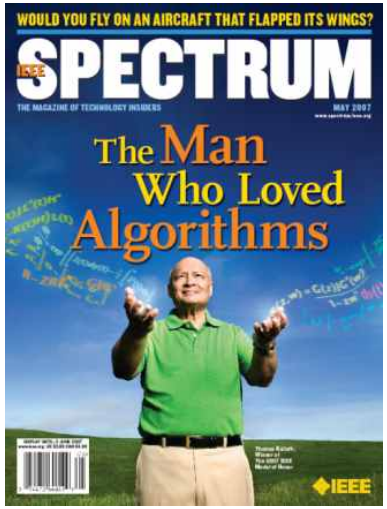


## Thomas Kailath
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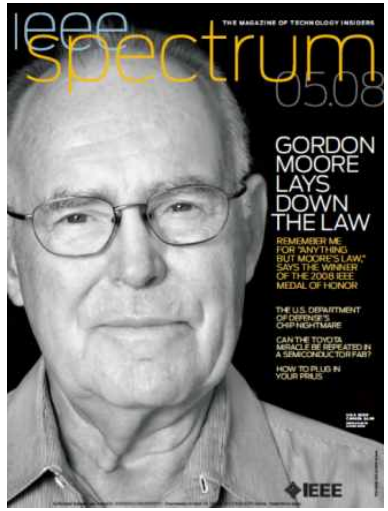
크레딧 카드의 프로세스를 위한 알고리즘 구현




## Gordon E. Moore
IEEE Medal of Honor
2008

무어의 법칙

집적회로 설계의 선구자


## Robert Dennard
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Dynamic Random-Access Memory(DRAM)의 개발

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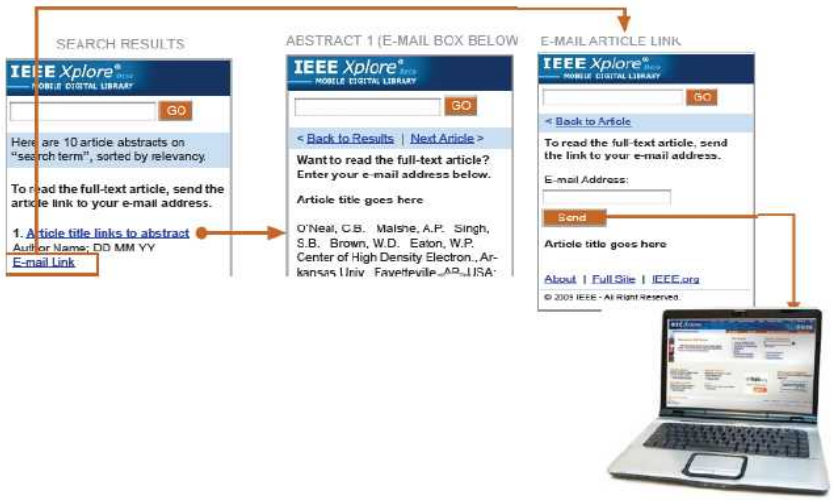


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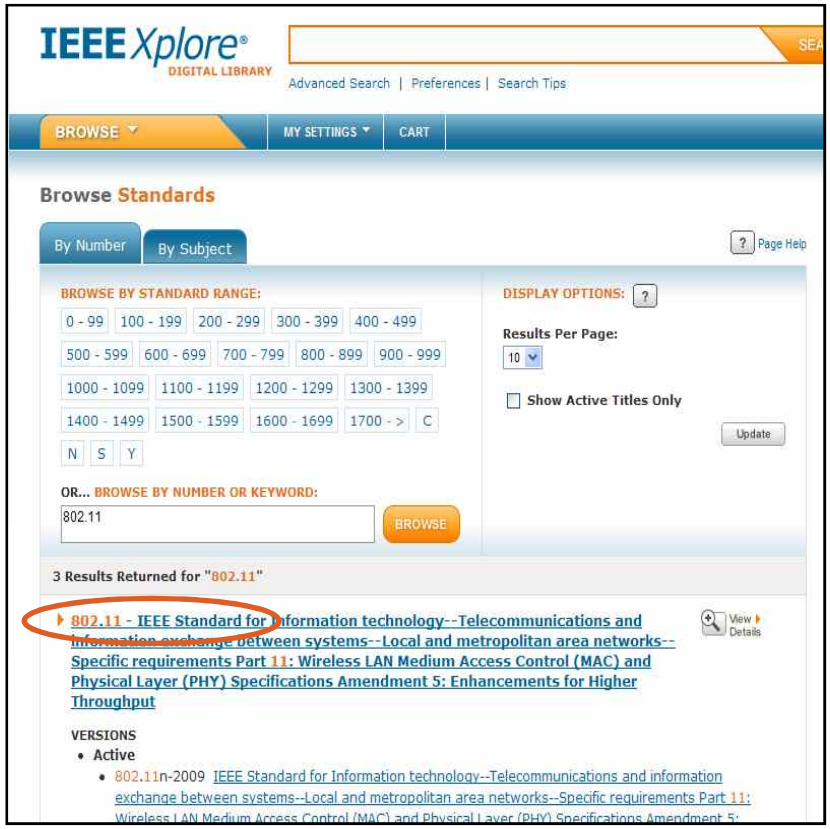
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IEEE Standard for Information technology--Telecommunications and information exchange between systems--Local and metropolitan area networks--Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment 5: Enhancements for Higher Throughput
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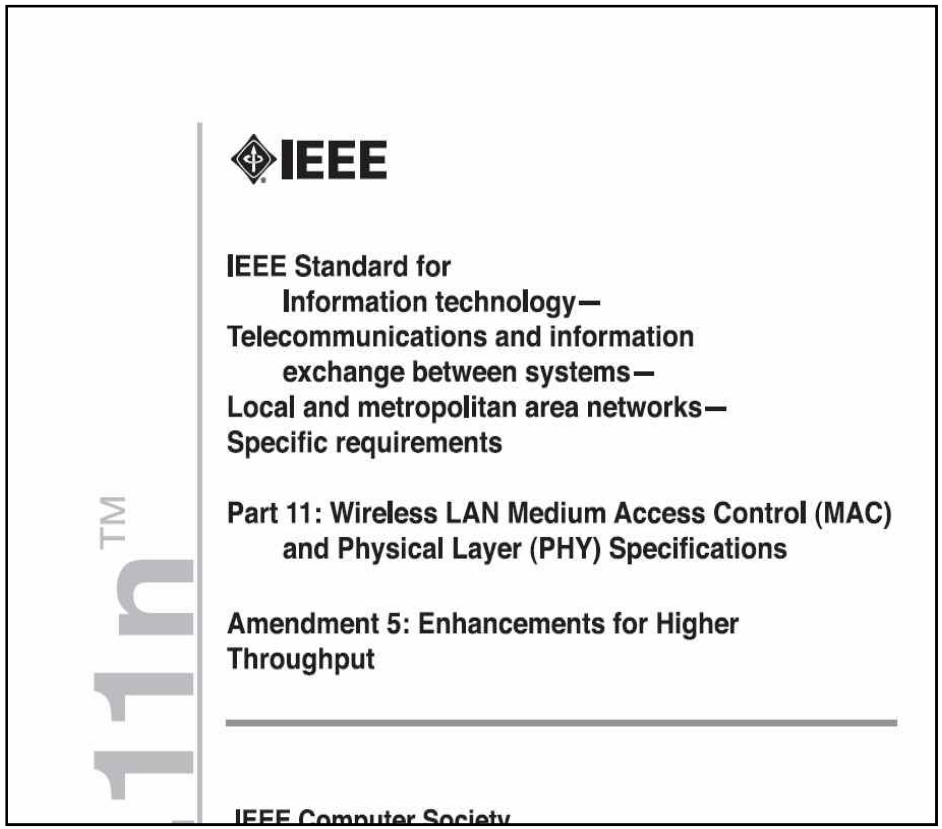
INSPEC Accession Number: 10973933
Digital Object Identifier: 10.1109/IEEESTD.2009.5307322
Persistent Link: http://ieeexplore.ieee.org/servlet/opac?punumber=5307291
More »
Year: 2009
ABSTRACT
This amendment defines modifications to both the IEEE 802.11 physical layer (PHY) and the IEEE 802.11 medium access control (MAC) sublayer so that modes of operation can be enabled that are capable of much higher throughputs, with a maximum throughput of at least 100 Mb/s, as measured at the MAC data service access point (SAP).

# Text DB와 시청각 DB의 연계활용

## IEL Standard 802.11



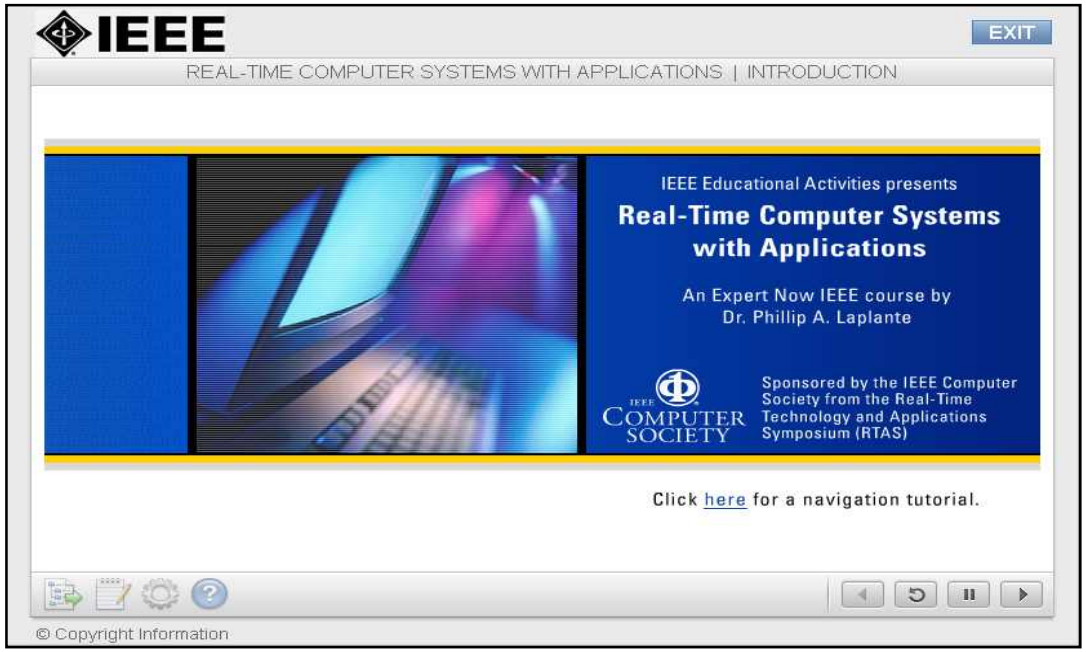

어렵다, 생소하다

자세히 교육 받을 수 있는 프로그램이 없을까?

**E-learning DB**

# E-learning DB

## IEEE Expert Now



# E-learning DB

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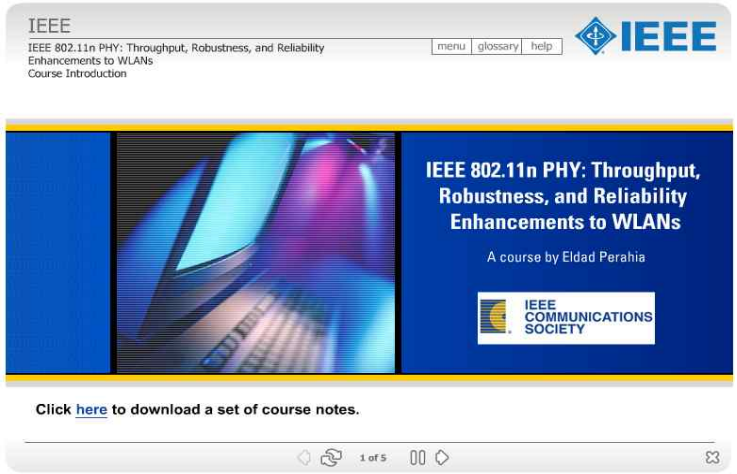

# IEEE E-learning DB - 특징

① IEEE만이 보유하고 있는 자료를 텍스트가 아닌 시청각 동영상으로 교육

② 오디오, 애니메이션, 그래픽, 수치 및 용어사전을 통한 학습 효과 최대화

③ 최신의 IEEE Conference의 발표 내용을 중심으로 제작이 되기 때문에 신속히 변화하는 핵심기술 및 동향습득 가능

④ IEEE가 엄선한 세계 최고의 석학들로 구성된 전문가에 의한 교육

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# Text DB와 E-learning DB 이용 효과

## 학사관리 + 연구활동 실현 가능

저비용으로 공과대학 모든 학과의 교육, 연구

교재로 활용 가능

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# IEEE E-learning DB - 주제

1. Aerospace
2. Bioengineering
3. Circuits and Devices
4. Communications
5. Computational Intelligence
6. Computing
7. Engineering Profession
8. Instrumentation and Measurement
9. Laser and Optics
10. Microwave Theory and Techniques
11. Nanotechnology
12. Photonics
13. Power and Energy
14. Reliability
15. Robotics and Automation
16. Sensors
17. Signal Processing

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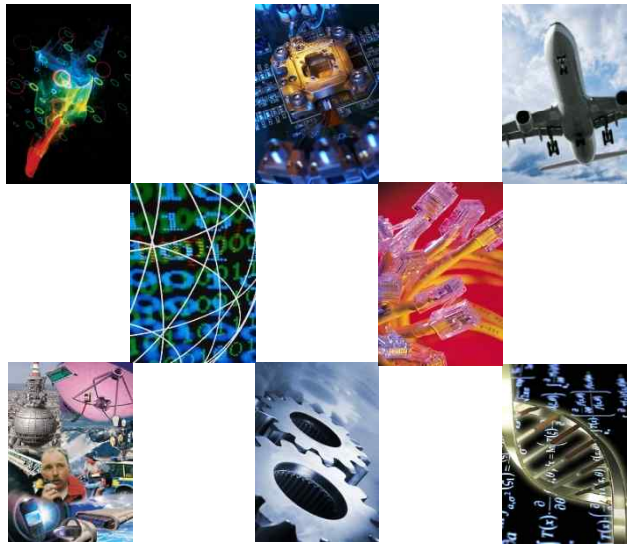

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## 2. IEEE Conference에서 발표된 자료들

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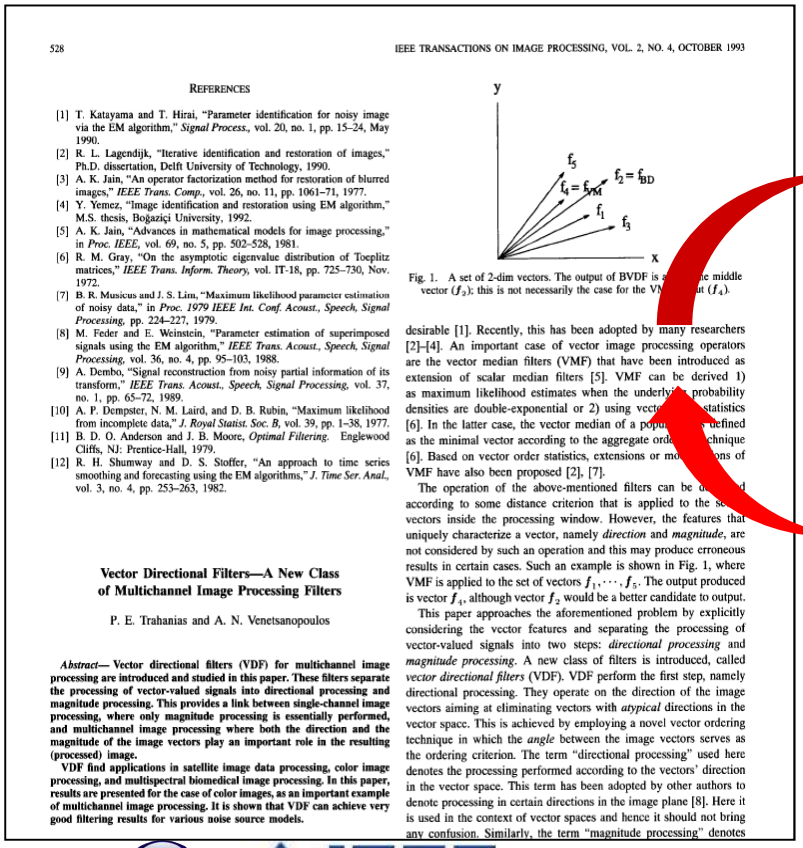
## 3. 연관된 주제의 자료들 *Image Processing*



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**Vector Directional Filters—A New Class of Multichannel Image Processing Filters**

P. E. Trahanias and A. N. Venetsanopoulos


*Abstract*— **Vector directional filters (VDF) for multichannel image processing are introduced and studied in this paper. These filters separate the processing of vector-valued signals into directional processing and magnitude processing. This provides a link between single-channel image processing, where only magnitude processing is essentially performed, and multichannel image processing where both the direction and the magnitude of the image vectors play an important role in the resulting (processed) image.**

**VDF find applications in satellite image data processing, color image processing, and multispectral biomedical image processing. In this paper, results are presented for the case of color images, as an important example of multichannel image processing. It is shown that VDF can achieve very good filtering results for various noise source models.**



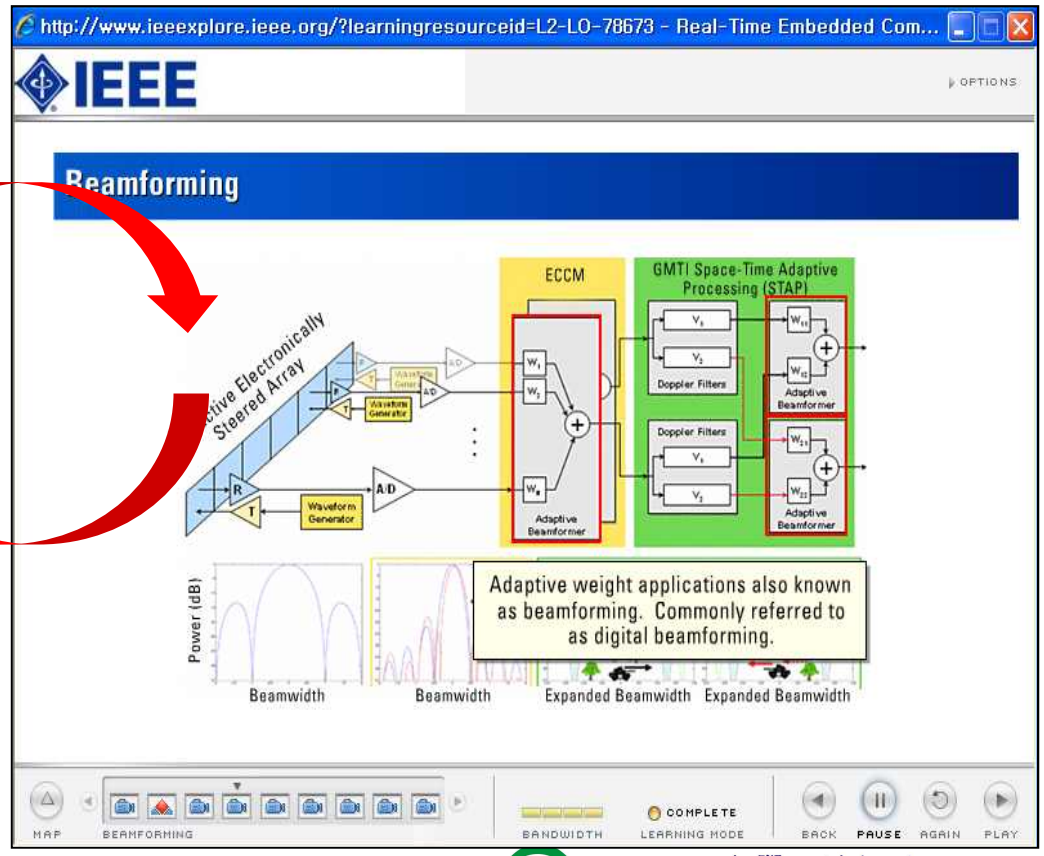


Fig. 1. A set of 2-dim vectors. The output of BVDF is ... middle vector ($f_2$); this is not necessarily the case for the VM... ut ($f_4$).

desirable [1]. Recently, this has been adopted by many researchers [2]–[4]. An important case of vector image processing operators are the vector median filters (VMF) that have been introduced as extension of scalar median filters [5]. VMF can be derived 1) as maximum likelihood estimates when the underlyi... probability densities are double-exponential or 2) using vect... statistics [6]. In the latter case, the vector median of a popu... defined as the minimal vector according to the aggregate ord... chnique [6]. Based on vector order statistics, extensions or mo... ons of VMF have also been proposed [2], [7].

The operation of the above-mentioned filters can be d... according to some distance criterion that is applied to the s... vectors inside the processing window. However, the features that uniquely characterize a vector, namely *direction* and *magnitude*, are not considered by such an operation and this may produce erroneous results in certain cases. Such an example is shown in Fig. 1, where VMF is applied to the set of vectors $f_1, \cdots, f_5$. The output produced is vector $f_4$, although vector $f_2$ would be a better candidate to output.

This paper approaches the aforementioned problem by explicitly considering the vector features and separating the processing of vector-valued signals into two steps: *directional processing* and *magnitude processing*. A new class of filters is introduced, called *vector directional filters* (VDF). VDF perform the first step, namely directional processing. They operate on the direction of the image vectors aiming at eliminating vectors with *atypical* directions in the vector space. This is achieved by employing a novel vector ordering technique in which the *angle* between the image vectors serves as the ordering criterion. The term "directional processing" used here denotes the processing performed according to the vectors' direction in the vector space. This term has been adopted by other authors to denote processing in certain directions in the image plane [8]. Here it is used in the context of vector spaces and hence it should not bring any confusion. Similarly, the term "magnitude processing" denotes

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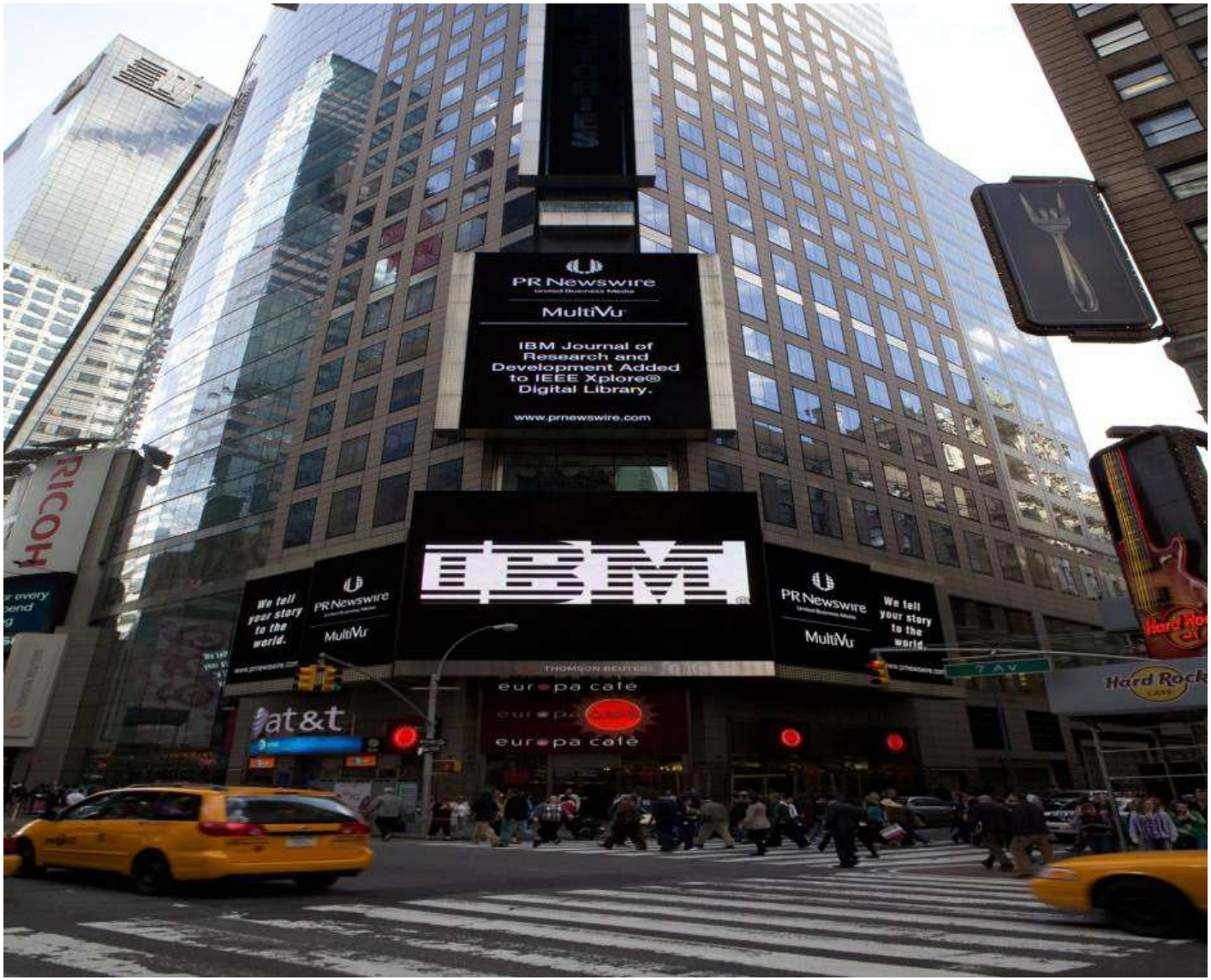
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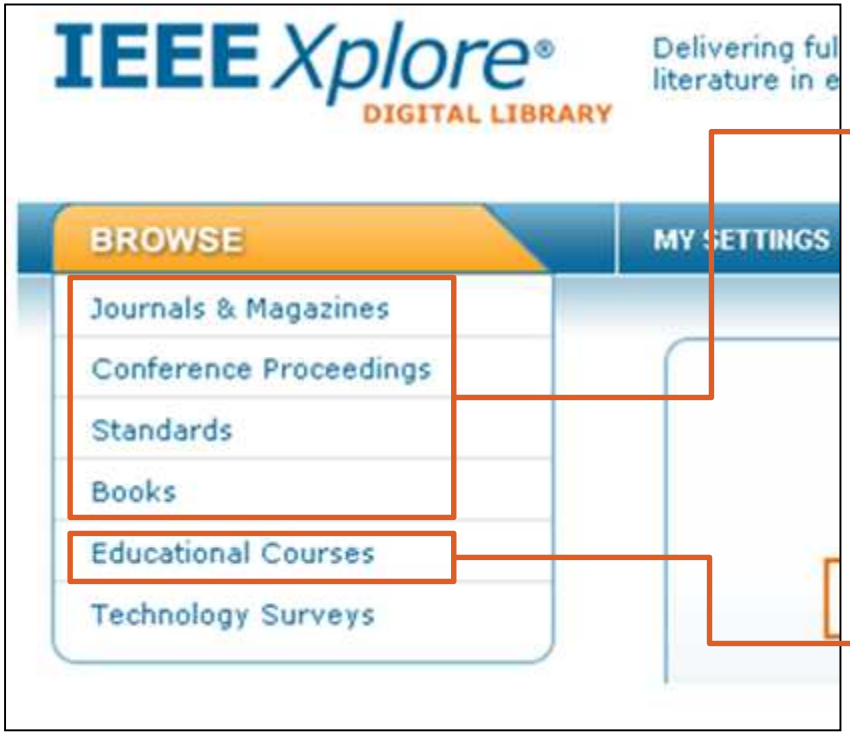


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