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The Current Source

August 2014 Newsletter of the Schenectady Section of the IEEE

http://sites.ieee.org/schenectady

The next Issue of Newsletter will be published in week of 13 October 2014. Article ideas are welcome!

Volunteers Wanted…
Many Volunteer opportunities available in IEEE Schenectady Section!!

- Executive committee members (serve the Section in overall meeting coordination, budget)
- Society committee members (plan local events for technical society to which the IEEE member belongs)
- Student Activities Chair (coordinate our participation in local educational events, namely Future Cities)
- Nominations committee (short term job – line up volunteers for the coming year)
- To any willing volunteers – We are in the process of nominating and will certainly have a couple positions to choose from
- ***Please contact Chandra Reis (creis@ieee.org) or Becky Nold (r.nold@ieee.org) to volunteer.***

IEEE PES - Schenectady Chapter (2014 Engineering Colloquium)

This one day conference will have 7 presentations with continuing education (PDH) credits.

Date: Friday, September 19, 2014

Time: 8.00 AM to 5:00 PM

Location: College Park Hall at Union College, 450 Nott Street, Schenectady, NY 12308

Cost: $70 for IEEE members
$140 for non-members
(Includes lunch & 7 PDH credits)
All payments must be received prior to September 6, 2014.

To reserve your seat: RSVP with your name, address, cell phone number, and email address ASAP to: Vincent.J.Forte@ieee.org and mail in your check

Make Check Payable to: "IEEE Schenectady Section" noting "2014 Colloquium" and attendee's name in comments line.

Send check to: Vincent Forte, IEEE PES Chair
5505 Tansy Court, Schenectady, NY 12303

Speaker	Company	Topic
Steve Dean	National Grid	Interconnection Process and Requirements - Load Customers
Chris Vance	National Grid	Interconnection Process and Requirements - DG Customers
Jamie Barrett	NYISO	Interconnection Process and Requirements
Reigh Walling	Walling Energy Systems Consulting	DG system grounding and over-voltages
John Golde	Golde Engineering	Substation Ground Grid Analysis and Design
Tom Short	EPRI	Open-Source Tools for Power System Modeling
Vince Forte	PES Chapter Chair	Engineering Ethics

More information regarding registration, contact: Vincent.J.Forte@ieee.org

Combination Innovation and its Patents

John Hershey

Editor's Note: John Hershey will be writing articles related to "Patents" throughout 2014.

His articles published in Section Newsletters are:
Patents and Patent Searching – February 2014
Improvement Patents – April 2014
Multi-Dimensional Thinking for Patents – June 2014

Often a combination invention results by bringing together two or more technologies into a novel system thereby forming a new and useful combination that is quite unobvious or has tremendous reach and import. During the cold war the Soviets understood this concept quite well and it spilled over into their political and military policy on ICBMs. The US established its land-based missiles under the control of the Air Force, an existing arm of the military. The Soviets however created a new service, the Strategic Rocket Forces. The reason, it is thought, was that the ICBM represented a combinatorial or "qualitative" innovation in weaponry as it was a new system founded in the synergy of three different components: (1) the missile, (2) the nuclear warhead, and (3) the guidance and control system. While the evolution of a bow and arrow weapon into a crossbow is more of a one dimensional or "quantitative" improvement innovation, the ICBM was multidimensional.

The LED Traffic Light Redux

Adding a new dimension of technology to an older invention may not be an improvement invention, as the inventor is not making an improvement to the older invention, but rather is creating an entirely new space. A good example of this is found in the LED traffic lights that we encountered in the article on Improvement Patents. As you recall, the improvement invention there was the replacement of the incandescent lamp with pluralities of LEDs. Because an LED may be turned on and off much faster than an incandescent bulb, the LED traffic light may also be for communications to drivers, and this is precisely what was offered in a paper and patent application:

"The visible light from an LED … traffic light can be modulated and encoded with information. Hence it can be used for the broadcasting of audio messages or any traffic or road information. Essentially, all LED traffic lights can be used as communications devices. … in which one or more LEDs are modulated and encoded with audio messages [1]*."*

The traffic light is of course visible to a vehicle and if that vehicle is equipped with an optical receiver, it will be possible to alert the vehicle and its occupants to all sorts of useful data. In a patent application filed in 1999, the inventors suggest that "Several applications of the general-purpose system are provided, including a vehicle speed limiting application, a vehicle location and guidance system application, and a portable traveler information and location system application." So the improvement invention of an LED traffic light becomes a combination invention if augmented by this new dimension of service.

The POP Score – a Way of Looking Backwards

Consider any combination patent. How far does it rise above the plane of practiced combinations? In an attempt to answer this, two of us [2] suggested an heuristic of utility for studying combination inventions. We called it the "POP score" for Prescience of the Patent. Its definition is arbitrary although it has strong roots in the geometric mean. It is far from foolproof, but still it seems to offer a clue and does seem intuitive.

The POP score is defined with respect to a plurality of terms indicative of a combination invention. To compute the POP score, you proceed by picking a time period for examination. This time period may be a specific year or a span of years. Then let:

- T be the number of terms you wish to look at
- N_i be the number of patents issued in the time period of interest that have term i in the fields of interest
- S be the number of patents issued in the time period of interest that have all T terms in the fields of interest
- And calculate $POP = \log_{10} \frac{(N_1 \cdot N_2 \cdots N_T)^{1/T}}{S}$

Interpretation of the POP score is of course best done by the user for his or her particular technological area. The following rough brackets may be of help.

- For a POP score between 0 and 1, the combination of technologies is mature. The combination has been well noted by those of ordinary skill in the art, much time and effort has been applied by many different organizations, and efforts may already be well underway to create standards and interfaces.
- For a POP score between 1 and 2, there is definite interest and progress in combining the technologies. The elevator has left the ground floor but it may not be too late for an entrepreneurial effort to still grow a valuable portfolio.

[1] "LED Traffic Light as a Communications Device," Pang et al, Proc. Int'l. Conf. on Intelligent Transportation Systems, 1999, pp. 788-793
[2] White Space Patenting," Hershey and Thompson, "Intellectual Property Today," Vol. 11, No. 8, August 2004

- A POP score of 2 or higher is evidence of innovation and breakthrough. To play in this area is exciting and the opportunity to seize broad claims in IP is at its peak. Speed is of the essence.

An Example

A great example for illustrating the combination invention and its analysis via the POP score is provided via the two great technologies: (a) the Internet and (b) the digital camera. The table below looks at the number of patents awarded these two technologies that were destined for combination. The data spans thirteen years and enumerates the number of issued US patents up through a filing year having the terms "Internet", "digital camera", and "Internet & digital camera" in their claims, their title, or their abstracts. See how long it took before the combination of the internet and digital camera was claimed.

Filing Year	Internet	Digital Camera	Internet &digital camera	POP
2002	17861	2620	147	1.67
2001	14978	2039	120	1.66
2000	11081	1463	67	1.78
1999	7031	950	37	1.84
1998	4225	621	21	1.89
1997	2297	337	10	1.94
1996	874	166	2	2.28
1995	199	84	1	2.11

Filing Year	Internet	Digital Camera	Internet &digital camera	POP
1994	47	47	-	-
1993	23	35	-	-
1992	14	29	-	-
1991	8	23	-	-
1990	8	18	-	-

Patents combining the Internet and a digital camera

The first patent, in which the terms appeared together, the one that was filed in 1995, was US 5845265 "Consignment Nodes." Look the patent up and study claims 1, 4, and 7 to learn more about the combination invention and to see how the combination invention was claimed.

Next Topic

In the next article we will look at some patents that resulted from invention to overcome constraints.

* *

John Hershey has a PhD in electrical engineering. He holds 193 US patents. He was elected a Fellow of the IEEE "for contributions to secure communications." He has authored or coauthored 8 technical books. Some of the material for these articles is derived from his book The Eureka Method: How to Think Like an Inventor published by McGraw-Hill. He is not a patent attorney or a patent agent. He does not presume to give legal advice.

IEEE Membership Elevations

The Section is aware of the following Senior Member elevations so far in 2014. If you have been a practicing engineer or scientist for more than 10 years, please consider applying for this special member status. Begin at the IEEE Senior Member page (http://www.ieee.org/membership_services/membership/senior/index.html). If you need a referral, the executive committee can provide that. Congratulations to our new Senior Members!

Naresh Acharya
Liwei Hao
Alex Pidwerbetsky
N Ravisekhar Raju
Ramanujam Ramabhadran
David Torrey
Dongrui Wu

IEEE Resume Lab

IEEE ResumeLab– has been launched for member use!

ResumeLab allows IEEE members to use customized templates to create resumes/CVs, letters related to the employment process, portfolios of past work, skills profiles, and video resumes. The product also provides members with the ability to conduct mock interviews. Finally, everything created in the product can be shared with colleagues, mentors, potential employers, the public, or social media via publicly-available links. Visit www.ieee.org/resumelab to see information about the product.

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Is your local society staffed?
If not, we need you.
A Society with no Events/Talks/Meetings for 3 years will be dissolved by IEEE.

IEEE-USA Legislative Update:

The IEEE-USA web site offers timely summaries of legislation that concerns you! Check IEEE-USA's Legislative Action Center (www.ieeeusa.org/policy; look in the upper right).