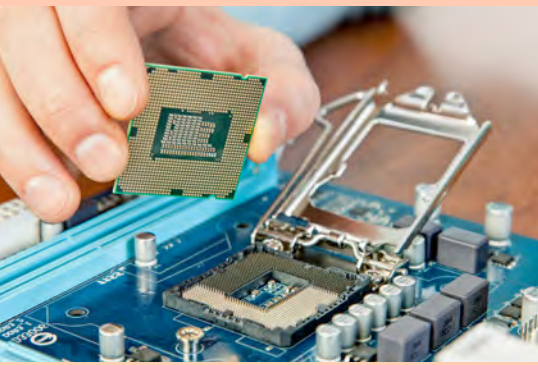




THE PULSE

MARCH 2021 | VOL. 68, NO. 3

OF LONG ISLAND



INSIDE THIS ISSUE

- + IEEE Long Island Section **Employ Me Day** | 5
- + Feature Article: **BLOCKCHAIN BASICS** | 6 - 9
- + **Write For The Pulse**— Let Your Voice Be Heard | 10
- + **Member Benefits** | 12
- + **Call for Senior and Life Members** | 13



2020 OUTSTANDING MEMBERSHIP
RETENTION PERFORMANCE
LONG ISLAND SECTION



March has arrived along with the supply-limited distribution of vaccines to combat a once-in-a-century pandemic. As we look forward to a demand-limited supply sometime in April, to be hoped, the Section has gotten used to planning virtual events for the membership and March has three of them. In the future, we expect many meetings will be hybrid events, with breakout sessions and some presentations online and others in person. But for now, we are all still stuck in front of our screens.

Events occurring this month include:

March 12, 3-5pm & March 19, 2-6pm

EMPLOY ME DAY 1:

Resume and interview skills presentations for professionals by professionals

March 18 and 19

2021 INTERNATIONAL ENERGY & SUSTAINABILITY CONFERENCE:

This is a virtual venue for one of the Section's most popular and influential conferences. Normally very well-attended, the online event this year is sure to attract a large audience.

New this year is a proposal sponsored by the Circuits and Systems Chapter to host a student design contest. The plan is to have the winning design(s) be given some form of recognition at the awards banquet in September, most likely a plaque naming the Student Chapter and the winning entrant. As I've often mentioned, we still look forward to the in-person **Power Electronics & Microwave Symposium** in the fall.

The Executive Committee is holding a full slate of meetings this year, preparing for a return to face-to-face social events among other things. I do not expect much change in the online calendar before late August at the earliest. Many models of herd immunity predict its onset somewhere between April and September. These models contain a tradeoff between deaths due to Covid and the time to herd immunity. As more people become infected, herd immunity propagates but more people die. Vaccination programs and social distancing remain the best tools we have, but people are getting stir-crazy with spring approaching after so long a period of isolation.

As usual, my final word is to stay safe, get a vaccine when you are able (I was finally able to get my first of two last week), wear masks and stay socially distant. But also, join us online for the scheduled meetings.

Stay healthy,

Arnold Stillman

IEEE Long Island Section Chair, 2021

THE PULSE OF LONG ISLAND



The Pulse of Long Island is produced by the Long Island Section of the Institute of Electrical & Electronics Engineers. It is published monthly except during July & August.

Arnold Stillman, Editor
pulse@ieee.li

Anthony Giresi, Graphic Designer
pulse@ieee.li

The opinions expressed in this newsletter are those of the authors, and no endorsement by IEEE, its officials, or its members is implied. IEEE prohibits discrimination, harassment, and bullying. For more information on IEEE policies, please visit www.ieee.org.

IEEE Long Island Section reserves the right to decide whether or not to publish any content in our sole discretion. Any contributed content may be edited before publishing.



INSTITUTE OF ELECTRICAL & ELECTRONICS ENGINEERS

445 Hoes Lane, Piscataway, NJ 08855-1331

Phone (USA & Canada): 1-800-678-4333

Phone (Worldwide): 1-732-981-0060

Website: www.ieee.org

E-mail: contactcenter@ieee.org

IEEE LONG ISLAND SECTION OFFICERS

CHAIR
ARNOLD STILLMAN
chair@ieee.li

FIRST VICE CHAIR
RONALD PIRICH
vc@ieee.li

TREASURER
SANTO MAZZOLA
treasurer@ieee.li

SECRETARY
RHONDA GREEN
secretary@ieee.li

JUNIOR PAST CHAIR
LOU D'ONOFRIO

SENIOR PAST CHAIR
MARJANEH ISSAPOUR

AFFINITY GROUPS and COMMITTEES

EMPLOYMENT ASSISTANCE
CHARLES PLECKAITIS
eac@ieee.li

EDUCATIONAL ACTIVITIES
MARJANEH ISSAPOUR
education@ieee.li

ENTREPRENEUR NETWORK
BILL WILKES SR.

MEMBERSHIP DEVELOPMENT
CARL MESHENBERG
membership@ieee.li

YOUNG PROFESSIONALS
YASH CHOWDHURY
yp@ieee.li

LIFE MEMBERS
DON GRIECO
life@ieee.li

STUDENT DEVELOPMENT ACTIVITIES
GLENN LUCHEN
student@ieee.li

WOMEN IN ENGINEERING (WIE)
MIHAELA RADU
wie@ieee.li

AWARDS COMMITTEE
NIKOLAOS GOLAS
awards@ieee.li

PROFESSIONAL ACTIVITIES
NIKOLAOS GOLAS
pace@ieee.li

LEGAL AFFAIRS
JOHN VODOPIA
legal@ieee.li

www.ieee.li

THE IEEE LONG ISLAND SECTION WEBSITE

The IEEE LI Section website is regularly updated to reflect recent section activity and upcoming events. Each Society and Affinity Group has a dedicated page that describes their function and includes contact information.

www.licn.org

CONSULTANT'S NETWORK OF LONG ISLAND

The Consultant's Network of Long Island maintains a referral service of engineering, computer, managerial and technical professionals.

membership@ieee.li

MEMBERSHIP DEVELOPMENT

For more information on membership with the LI Section of the IEEE, e-mail Carl Meshenberg at: membership@ieee.li

 <p>AEROSPACE & ELECTRONIC SYSTEMS SOCIETY (AES) Chair: Dave Mesecher Vice Chair: Vacant Email: aes@ieee.li</p>	 <p>ANTENNAS AND PROPAGATION SOCIETY (APS) Chair: Bryan Tropper Vice Chair: Sai Padmanabhan Email: ap@ieee.li</p>	 <p>CIRCUITS AND SYSTEMS SOCIETY (CAS) Chair: James Colotti Vice Chair: Supriya Karmakar Email: cas@ieee.li</p>	 <p>COMMUNICATIONS SOCIETY (COMSOC) Chair: Howard Hausman Vice Chair: Tony Bowden Email: communications@ieee.li</p>
 <p>COMPUTER SOCIETY (CS) Chair: Barbara Porter Vice Chair: Brian Quinn Email: computer@ieee.li</p>	 <p>ELECTROMAGNETIC COMPATIBILITY SOCIETY (EMCS) Chair: James Colotti Vice Chair: Bob DeLisi Email: emc@ieee.li</p>	 <p>ENGINEERING IN MEDICINE & BIOLOGY SOCIETY (EMBS) Chair: John Vodopia Vice Chair: Vacant Email: emb@ieee.li</p>	 <p>INSTRUMENTATION AND MEASUREMENT SOCIETY (IMS) Chair: Joe Jordan Vice Chair: Ephraim Adeola Email: im@ieee.li</p>
 <p>MICROWAVE THEORY AND TECHNIQUES SOCIETY (MTT) Chair: Saikumar Padmanabhan Vice Chair: Eric Darvin Email: mtt@ieee.li</p>	 <p>NUCLEAR AND PLASMA SCIENCES SOCIETY (NPS) Chair: Shaorui Li Vice Chair: Graham Smith Email: nps@ieee.li</p>	 <p>PHOTONICS SOCIETY (IPS) Chair: Adam A. Filos Vice Chair: M. Nazrul Islam Email: photonics@ieee.li</p>	 <p>POWER & ENERGY/INDUSTRY APPLICATIONS SOCIETY (PES & IAS) Chair: Marjaneh Issapour Vice Chair: Lou D'Onofrio Email: power@ieee.li</p>
 <p>POWER ELECTRONICS SOCIETY (PELS) Chair: Ronald DeLuca Vice Chair: Predrag Hadzibabic Email: pels@ieee.li</p>	 <p>PRODUCT SAFETY ENGINEERING SOCIETY (PSES) Chair: Tom Lanzisero Vice Chair: Vacant Email: safety@ieee.li</p>	 <p>SIGNAL PROCESSING SOCIETY (SPS) Chair: Jessica Donaldson Vice Chair: Dave Mesecher Email: signal@ieee.li</p>	 <p>SOCIAL IMPLICATIONS OF TECHNOLOGY SOCIETY (SSIT) Chair: Howard Edelman Vice Chair: John Vodopia Email: social@ieee.li</p>
<p>The Long Island Section of IEEE has 18 Chapters. Each Chapter is a technical subunit of the Long Island Section, associated with an IEEE Society. The Chapters, as well as the Section, are always welcoming volunteers. If you would like to help with any of the Long Island Chapter's steering groups, please do contact the relevant Chapter Chair, Vice Chair, or one of the Section officers.</p>		 <p>SYSTEMS COUNCIL (SYSC) Chair: Stephanie White Vice Chair: Vacant Email: systems@ieee.li</p>	 <p>TECHNOLOGY & ENGINEERING MANAGEMENT SOCIETY (TEMS) Chair: Brian Quinn Vice Chair: Barbara Porter Email: tmc@ieee.li</p>



employ ME Day

TOTALLY ONLINE

3:00 - 5:00 pm
FRIDAY, MARCH 12, 2021

2:00 - 5:00 pm
FRIDAY, MARCH 19, 2021

FREE TO ALL

RESUME and ABOUT ME SPEECH CHECKUPS

SUBMISSIONS:

Jan 25 – Mar 17, 2021

RESUME CHECKUP

Upload your Resumes in
.pdf format to be critiqued
by a Professional Specialist

ALL YOU NEED IS:

1. Your **.pdf** Resume
2. Your Name
3. Your Phone Number
4. Your email address

A secondary form, which is
required, will be sent to you.

E-MAIL TO:

lmc2020.ieee@gmail.com

Subject: **RESUME CHECK**

ABOUT ME SPEECH CHECKUP

2 Minute Elevator Speeches,
~200 words. Upload your About
Me Speeches in **.pdf format**
to be critiqued by Consulting
Specialists

ALL YOU NEED IS:

1. Your **.pdf** About Me Speech
~200-word
2. Your email address

E-MAIL TO:

lmc2020.ieee@gmail.com

Subject: **ABOUT ME CHECK**

FRIDAY, MARCH 12

3:00 PM - 4:00 PM

WINNING RESUME WEBINAR

Find out about winning
resume tips by a Professional

PRE-REGISTER:

c.pleckaitis@ieee.org

4:00 PM - 5:00 PM

INTERVIEW TIPS & TECHNIQUES WEBINAR

Learn winning interview tips,
techniques, and strategies by
a Professional Career Consultant

PRE-REGISTER:

c.pleckaitis@ieee.org

FRIDAY, MARCH 19

2:00 PM - 2:20 PM

ABOUT ME WEBINAR (20 Minutes)

Learn Winning Tips & Techniques
for a Better About Me Speech

PRE-REGISTER:

c.pleckaitis@ieee.org

2:20 PM - 3:00 PM

ABOUT ME WORKSHOP

- Present your **ABOUT ME** Speech
LIVE to Consulting Specialists
- Held in Individual Online
Meeting Rooms
- In 6 minutes, Limited Sessions
(2 min speech; 4 min Q&A)

PRE-REGISTER:

c.pleckaitis@ieee.org

MARCH 19, 2021, 2 - 5 PM

IEEE SPONSORED BREAKOUT SESSIONS

For up-to-date information on date/other
changes, look in next month's *Pulse* or visit
the EAC Website: ieee.li/committees/employment-assistance-committee. If interested in
participating in the Job Fair, which is **FREE**
and totally **ONLINE** to all companies, please
respond

to the contact information below.

Many capable technical candidates on
Long Island are available for employment
and are waiting to be reached.

CONTACT: Charles Pleckaitis

E-MAIL: c.pleckaitis@ieee.org

WEBINAR PRE-REGISTRATION:

Send the following information:

1. Your Name
2. Which Webinar wish to attend:
 - WINNING RESUME
 - ABOUT ME
 - INTERVIEW TIPS

E-MAIL: C.pleckaitis@ieee.org

Subject: **WEBINAR SIGN UP**

WEBSITE: ieee.li/employment

WORKSHOP INFORMATION:

ieee.li/education

ieee.li/young-professionals

ATTENTION LI COMPANIES

The Employment Assistance Committee (EAC)
wishes to coordinate with representatives of
LI companies for a free Online IEEE sponsored
Job Fair. Internships are welcomed. Present Job
needs & interview via Side sessions with Zoom.

For information about EAC, the IEEE EAC Website visit:
<https://ieee.li/committees/employment-assistance-committee>



BLOCKCHAIN BASICS

ARNOLD STILLMAN

A couple of years ago, I gave a talk to the IEEE Life Members entitled Blockchains and Bitcoin, and Introduction. It was a gentle entrée to an emerging technology that has continued to captivate people with possibilities. In this short article, I will reprise the blockchain elements of the talk. Bitcoin and its cryptocurrency cousins are pretty much well-covered in the news and the details of their implementation are beyond the scope of this article. Furthermore, the survival of cryptocurrencies is dependent on the survival of blockchain technology, but the reverse is not true. The long-term potential of Bitcoin and other cryptocurrencies is not as assured as the underlying blockchain foundation.

WHAT IS A BLOCKCHAIN AND HOW DID IT COME TO BE?

The blockchain algorithm made its public debut October 31, 2008. On that date, Halloween interestingly, the almost assuredly pseudonymous developer Satoshi Nakamoto published “*Bitcoin: A Peer-to-Peer Electronic Cash System*” to the [gmane.-comp.cryptography.general](mailto:gmane.comp.cryptography.general@nongnu.org) newsgroup. In that message, Nakamoto refers to a [paper on creating a digital cash system](#). The paper outlines the underlying mechanism for ensuring that a digital “coin” that has been spent in a transaction and thus no longer owned by the spender is not available to the spender to reuse. In the world of physical currency, a dollar that has been spent has a serial number that no longer belongs to the spender, but a counterfeit of that dollar has the same serial number and can be spent again. In fact, numerous counterfeits, all identical, can represent the same underlying one-dollar value. The blockchain algorithm that Nakamoto developed tries to guarantee that a transaction of value, the passing of a coin from buyer to seller, transfers that value once and only once. The method involves a ledger system that encrypts the previous history of transactions with the current transaction into a block of data. This block of data contains within it a link to all previous transactions as well as a representation of the current transaction. Hence, stringing these links together into a chain of discrete blocks yields a “blockchain.”

BUILDING A BLOCKCHAIN

In this section, I will rely quite a bit on work by [Eric Munsing](#). However, before we start making our own blockchains, it is important to understand trapdoor functions and hashes. These are the essential mathematical tools that enable the blockchain algorithm.

TRAPDOOR FUNCTIONS

Trapdoor functions are functions that are easy to calculate but extremely difficult to invert. One of the first examples is¹

$$Y = \alpha^X \text{ mod } q, \text{ for } X = 18,$$

where q is a prime number. I can now rewrite this as

$$Y = (((\alpha^2)^2)^2) \times \alpha^2.$$

Choosing $\alpha=1.5$, gives $Y=1477.89$. Now, can we invert the calculation to get back $X=18$, where the value is strictly an integer? To do so, it is necessary to solve

$$X = \frac{\log 1477.89}{\log 1.5}.$$

But this gives

$X = 7.29836/0.405465 = 17.999975336958798$, Not an integer. When X and α are 64-digit numbers, the inversion is practically impossible.

HASHES

A hash is a type of trapdoor function that maps a number to another number, where number here is what we understand as a file, since a digital file is essentially one long number. Hashes are not unique; a four-bit number has 16 different combinations. A two-bit hash of the input could only have four possibilities. There must be a collision; every hash would have four distinct possible inputs. In the real world of hashes, the numbers are so big that collisions are rare. These properties make them a basic encryption tool. Some relevant other properties are:

- Small changes in input create large changes in output.
- Inputs are padded to uniform block sizes.
- NIST governs hash standards ([FIPS PUB 180-4](#)).

CONTINUED ON PAGE 7 ►

◀ CONTINUED FROM PAGE 6

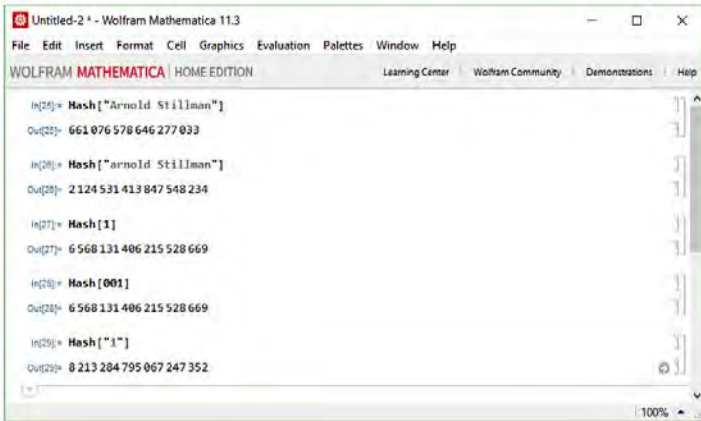


FIGURE 1
Shows four hashes— the first two inputs differ by a single letter; the next three by the change of input from two equivalent formats of a number to its text representation.

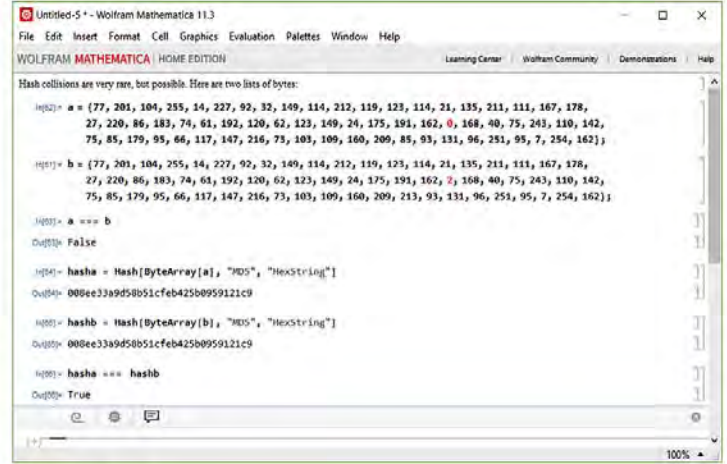


FIGURE 2
Demonstrates different inputs with the same hash. The different input bytes are in red.

Although hashes may look unique, as I mentioned, there must be collisions.

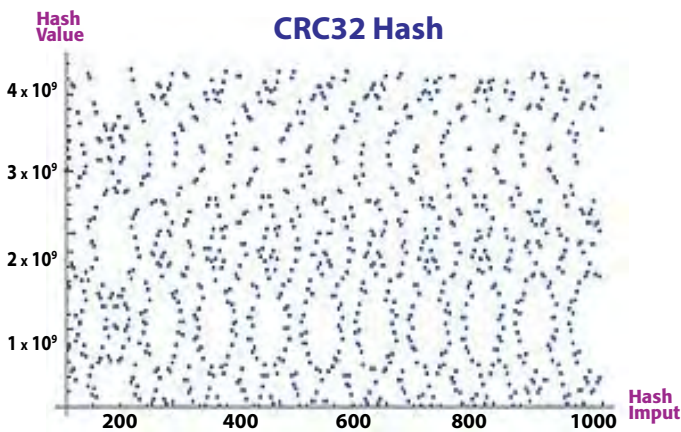
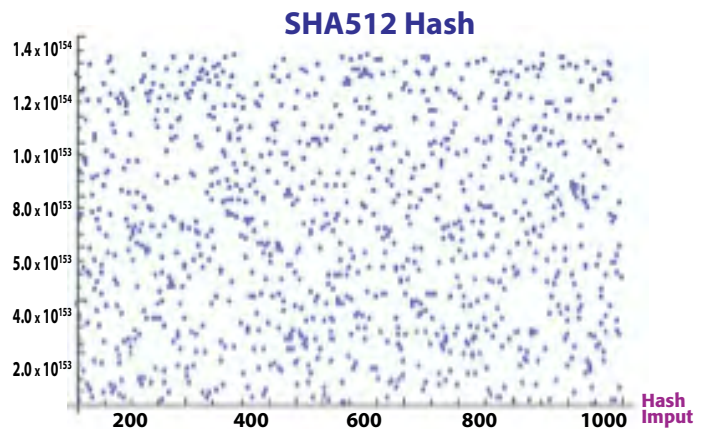


FIGURE 3
Two hashes of the first 1000 integers are shown. The **CRC32** hash is obviously not very random.



Why does NIST have a hash standard? Randomness is key to encryption and very difficult to obtain. Some hashes are not very random.

THE BLOCKCHAIN ALGORITHM

Hash in hand, I can now begin to construct the blockchain. The individual blocks of the chain all contain a body and a header. The algorithm will follow these steps:

STEP 1. Create a transaction.

STEP 2. Verify the transaction.

STEP 3. Construct a block of transactions consisting of:

- A. The current transaction
- B. A hash of the previous block header (trapdoor **easy** calculation)

STEP 4.

Solve the proof of work.

- A. Present the proposed new block to the network of nodes.
- B. The first node to generate the correct hash wins (trapdoor **hard** calculation)
 - i. Network of nodes performs the calculation.
 - ii. The node successfully obtaining the hash signals the proof-of-work to the network

STEP 5. Add the block to the chain.

CONTINUED ON PAGE 8 ▶

◀ CONTINUED FROM PAGE 7

At this point, it is important to note a few details of this algorithm. Step 4 forms the basis for Bitcoin mining, whereby the node generating the correct hash receives a reward of some fraction of a Bitcoin. Although it is beyond the scope of this article, it deserves mention that the fraction of a Bitcoin mined is not constant but declines over time. Step 4 also contains the blockchain fundamental calculation, that of the correct hash to add a block to the chain. This step deserves a full explanation.

STEP 4

Once I have what I think is a valid transaction, I look at the last block in the existing chain. It has within it the target hash. My new hash must be related to the old one somehow. Algorithms can vary at this point, but I will use the Bitcoin model. First, choose a number, any number. This, in blockchain parlance, is the nonce. The steps are:

1. Choose a nonce
2. Combine (i.e., string them end to end)
 - a. The proposed new block
 - b. The header of the previous block
 - c. The nonce
3. Hash the combination.
4. If the hash \leq target hash, proof of work is verified
5. If the hash $>$ target hash, got back to Step 1.

So, at this point, what is the target hash? In practice, the blockchain starts with a genesis block, the first block in the chain, and an initial hash given by an accepted hash function.

This initial hash is large enough that it will accommodate all possible future transactions up to some very large limit. It is not infinite, however. On advantage of this method is that counting leading zeroes serve to perform the checking of the proof of work. Figure 4 shows several attempts at guessing a hash by counting leading zeroes given a simple input string. It took twelve attempts to guess the correct MD5 hash. I do not recommend trying this on real input blocks with bigger hashes, unless you have years to waste.

Also key to verifying the proof of work is the distributed task of calculating the hash. This is the very central idea of the blockchain. The calculation is so difficult that only a distributed network of calculating nodes can accomplish the task in a reasonable amount of time. If there are fewer nodes, by assent among the nodes, the difficulty gets eased; if there are more nodes, the difficulty is increased. The determining factor is the average time it takes to perform the proof of work. The statistics of the calculation and the possibility of bad actors emerging, (i.e., counterfeits) are in the Nakamoto paper. This networked calculation makes the blockchain a *distributed ledger system*. This property is unique and is the reason for all the hype. There are many claims of blockchain techniques in use that abuse this definition by not employing a distributed calculation. In fact, the best definition of the blockchain is just that, a distributed ledger system that guarantees accuracy by encryption of all previous entries.

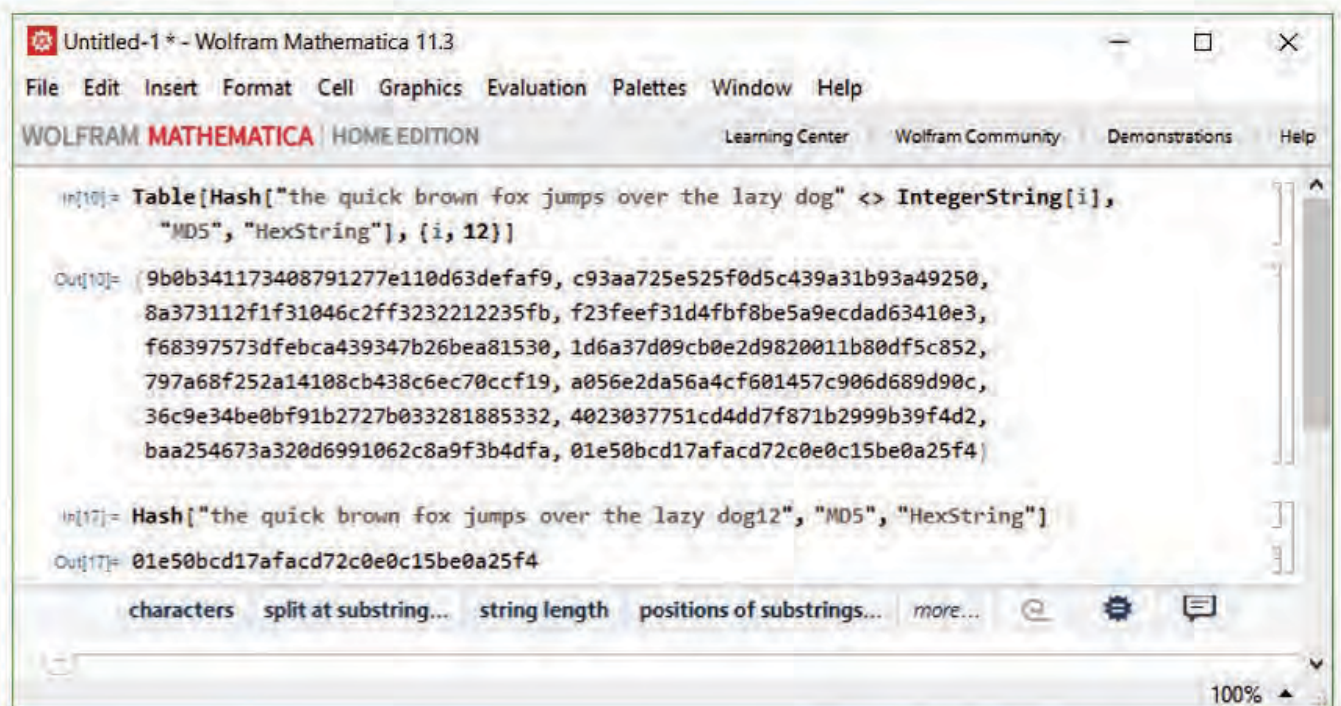


FIGURE 4

CONTINUED ON PAGE 9 ▶

CONSTRUCTION OF THE BLOCKCHAIN

A python pseudocode implementation of a sample blockchain starts with some basic functions.

With these functions, I can now create a toy blockchain. The first block is the genesis block; its contents are a sample transaction between Alice and Bob. A genesis block is necessary to generate the first hash.ⁱⁱ With the first block in place, make the next transaction and append it to the chain. The result is the new blockchain. What this toy example does not do is provide the proof-of-work, which would be intermediate between making a block of transactions and validating the block before adding it to the chain.

```

hashMe(post=""):
1. import hashlib
2.
3. def hashMe(post=""):
4.     if type(post) != str:
5.         post = json.dumps(post, sort_keys=True)
6.     if sys.version_info.major == 2:
7.         return unicode(hashlib.sha256(post).hexdigest(), 'utf-8')
8.     else:
9.         return hashlib.sha256(str(post).encode('utf-8')).hexdigest()

makeTransaction()
1. def makeTransaction():
2.     tankId = "012345"
3.     accountId = "Poemtech"
4.     timestamp = strftime("%d %b %Y %H:%M:%S", gmtime())
5.     payload = {u'serNum':serNum, u'ccid':ccid, u'tankId':tankId, \
6. u'accountId':accountId, u'previousLevel':previousLevel, u'tankLevel'\
7. :currentLevel, u'timestamp':timestamp}
8.     return payload

makeBlock()
1. def makeBlock(txns, chain):
2.     parentBlock = chain[-1]
3.     parentHash = parentBlock[u'hash']
4.     blockNumber = parentBlock[u'contents'][u'blockNumber'] + 1
5.     blockContents = {u'blockNumber':blockNumber, u'parentHash':parentHash,
6. u'txnCount':len(txns), 'txns':txns}
7.     blockHash = hashMe( blockContents )
8.     block = {u'hash':blockHash, u'contents':blockContents}
9.
10.    return block

makeGenesisBlock()
1. state = {u'Alice':50, u'Bob':50} # Define the initial state
2. genesisBlockTxns = [state]
3. genesisBlockContents = {u'blockNumber':0, u'parentHash':None, u'txnCount':1, u'txns':genes
4. isBlockTxns}
5. genesisHash = hashMe( genesisBlockContents )
6. genesisBlock = {u'hash':genesisHash, u'contents':genesisBlockContents}
    
```

FIGURE 5

APPEND THE BLOCK TO THE CHAIN

```

1. state = makeTransaction()
2. chain = [makeGenesisBlock()]
3. inputBuffer = [makeTransaction() for i in range(20)]
4. blockSizeLimit = 5
5.
6. while len(inputBuffer) > 0:
7.     bufferStartSize = len(inputBuffer)
8.     txnList = []
9.     while (len(inputBuffer) > 0) & (len(txnList) < blockSizeLimit):
10.        newTx = inputBuffer.pop()
11.        validTx = checkTx(newTx, state)
12.
13.        if validTx:
14.            txnList.append(newTx)
15.            state = updateState(newTx, state)
16.        else:
17.            print("transaction skipped")
18.            sys.stdout.flush()
19.            continue
20.    newBlock = makeBlock(txnList, chain)
21.    chain.append(newBlock)
    
```

FIGURE 6

Done! Many examples of blockchain implementations exist on the web. This is a very simple one and almost useless for real work, but it does illustrate the structure and assembly of a local blockchain. What is missing is the distributed element for proof of work and community access to the ledger.

ⁱ *New Directions in Cryptography*, IEEE Trans. on Inf. Theory, 11/6/1976

ⁱⁱ Supposedly, the first Bitcoin transaction was for pizza.

LET YOUR VOICE BE HEARD

WRITE TO THE PULSE

The Pulse of Long Island is a newsletter for the members of the IEEE Long Island Section. You can let your voice heard by writing to the Editor. How to bring more value to our members? Interesting new technology, or a project? An issue of interest to members of the IEEE Long Island, Long Island engineers and computer professionals, or Long Island technical community at large? Write to the Pulse. Let your letter be read, and your voice heard.

HOW CAN I CONTRIBUTE TO THE PULSE?

Send your letters or articles via email to pulse@ieee.li. If selected for publication, the letter or article will be edited before being published.



ADVERTISERS:
Please contact us at pulse@ieee.li for advertising rates.



CONTRIBUTION DEADLINE:
20th of a month for the next month edition.

CONTRIBUTIONS FROM LONG ISLAND TECHNICAL & ENGINEERING COMPANIES:
Publish your technology-related press release (up to one page) at no cost. Please send the press release as a PDF file attached to email to pulse@ieee.li, addressed to the Editor, with a Subject line "Pulse -PR" followed by your company name, and the responsible contact person's name, email and phone number in the email body.



THE PULSE OF LONG ISLAND

CONTRIBUTE TO THE PULSE - LET YOUR LETTER BE READ and LET YOUR YOUR VOICE BE HEARD



THURSDAY, NOVEMBER 4, 2021
POWER ELECTRONICS SYMPOSIUM 2021

Arrive Anytime, Leave Anytime, from Noon to 8 PM

The Long Island Power Electronics Symposium and Exhibits is the area's premier annual event that brings together the local power electronics community.

For more information: www.ieee.li/pes

LOOKING FOR AN UPDATE ON SECTION EVENTS?

FOR UPDATES ON ALL LONG ISLAND SECTION EVENTS, CHECK OUT THE IEEE LONG ISLAND SECTION WEBSITE:

www.ieee.li



IEEE computer society

SHARE YOUR EXPERIENCE PRESENT YOUR WORK TO THE IEEE

**Working on an interesting project? Or have an interesting topic to talk about?
A startup ready to spread a word, or in need of beta testers with computer knowledge?**

Computer Society Chapter invites you to present your project or your experience. For one of the upcoming meetings, we'd like to mash technical and social, and have several presenters presenting interesting computer-related topics in a shorter timeframe, fostering conversation. This is an opportunity to meet each other, learn about our work and possibly identify opportunities for collaboration.

Contact IEEE Computer Society Chapter at computer@ieee.li with your suggested topic.

IEEE MEMBERSHIP and MEMBER BENEFITS

IEEE membership offers access to technical innovation, cutting-edge information, networking opportunities, and exclusive member benefits. Members support IEEE's mission to advance technology for humanity and the profession, while memberships build a platform to introduce careers in technology to students around the world.



JOIN IEEE OR RENEW YOUR MEMBERSHIP

Reach your full potential as part of the world's largest technology community. Join professionals, experts, and advisors who can help shape your career, offer resources to acquire new skills, and advance your professional development.



MEMBER BENEFITS

As an IEEE member, you'll be presented with new resources, valuable opportunities, and many discounts that will help you advance your career in the right direction. You can find colleagues who share your vision and commitment—those who are moving technology forward today.



ENHANCE YOUR MEMBERSHIP—JOIN AN IEEE SOCIETY

IEEE Societies provide members with opportunities to connect with experts and network with colleagues locally and abroad—all while staying up-to-date on technology and trends in their industry.



GIFT OF MEMBERSHIP

IEEE membership delivers access to the industry's most essential technical information and provides networking opportunities both locally and globally. Members have the ability to stay current in their chosen profession, connect with peers, and invest in their future.



MEMBER-GET-A-MEMBER

Consider sharing your IEEE membership experience and get rewarded for doing so. Through the Member-Get-a-Member (MGM) program, IEEE rewards your efforts in recruiting new members. Your local IEEE Section can also benefit.



IEEE.tv

Made possible by IEEE members, IEEE.tv is an award-winning, Internet-based television network, producing special-interest programming about technology and engineering for IEEE members and the general public.

Get access with new resources, valuable opportunities, and many discounts that will help you advance your career in the right direction.

WHEN YOU JOIN IEEE, YOU:

- Join a community of over 425,000 technology and engineering professionals united by a common desire to continuously learn, interact, collaborate, and innovate
- Get the resources and opportunities you need to keep on top of changes in technology
- Get involved in standards development
- Network with other professionals in your local area or within a specific technical interest
- Mentor the next generation of engineers and technologists and so much more.

IEEE members can access information on local events and activities by signing in to myIEEE, the members' personalized gateway to IEEE membership. In addition, members can also:

- Access individual Society memberships and subscriptions
 - Connect with local IEEE Sections and volunteer leadership
 - Find upcoming conferences
- Learn more about individual benefits
- Read the latest news from IEEE, IEEE Spectrum, IEEE Standards News, and The Institute

No need to over-engineer this.

Satisfaction will increase with exclusive IEEE member discounts and insurance.

Special, low pricing creates high value for IEEE Members.* Tap into exclusive member discounts on products and services from trusted brands.

*Where available



Leverage your IEEE membership today!
Visit iee.org/discounts and learn how this inverse relationship can be a proven formula.

You've Always Set Yourself Apart. Now it's Time to make it Official. Nominate Yourself to become a...

IEEE SENIOR MEMBER



Being elevated to senior member recognizes people who have moved beyond entry-level work in their careers. It also encourages them to engage more broadly with engineers and other technical professionals in companies and universities outside their own. To be eligible for senior member status, members must have worked in a professional capacity in a technical field for at least 10 years. Educational experience is partially credited toward that time. Nominees must also have professional references from three IEEE senior members, Fellows, or honorary members. If you're interested in elevation, you don't have to wait to be nominated—you can nominate yourself.

>> APPLY FOR SENIOR MEMBER GRADE

IEEE LIFE MEMBERS, WRITE FOR THE PULSE!



The Section is inviting you to record your stories and histories in our monthly publication, the *Long Island Pulse*. An article of approximately 300 – 350 words is recommended.

LET US HEAR FROM YOU.

Send your article to: pulse@ieee.li
Life Member Chair: life@ieee.li

The **IEEE Long Island Section** has held meetings with many of our Life Members and Senior Engineers, in recent months. Your stories and histories in engineering are interesting, inspiring and should be recorded for future generations. You have served your profession for many years, many have served our country in the military, many as engineers fighting the Cold War. The many contributions are the legacy to this new digital age, space age, environmental age and beyond.

WANTED: IEEE LIFE MEMBER NEEDED TO VOLUNTEER TO SUBMIT A MONTHLY HISTORY ARTICLE FOR THE PULSE

The **PULSE** is seeking a IEEE LI Life Member to write the *Long Island Electrical & Electronic History* monthly article for the **Pulse**. If interested contact pulse@ieee.li

WE WANT YOUR STORIES



**IEEE
CONSULTANTS
NETWORK OF
LONG ISLAND**

THE IEEE CONSULTANTS NETWORK OF LONG ISLAND (LICN)

is a nonprofit professional organization affiliated with the Institute of Electrical and Electronics Engineers. Our members include dozens of electrical, electronic, mechanical and software engineers with expertise in over 65 categories of technology and business. All are members of the IEEE and adhere to the IEEE professional codes of ethics.

MEMBER
IEEE L.I. CONSULTANTS NETWORK



**PETER BUITENKANT
CONSULTANT**

MICROPROCESSOR HARDWARE / SOFTWARE DESIGNS
DIGITAL CIRCUIT DESIGN • TRAINING COURSES

WEBSITE: www.peterbui-consult.com

24 Thorngrove Lane
Dix Hills, NY 11746

VOICE: (631) 491-3414
EMAIL: peterbui@optonline.net

(516) 378-0979

ambertec@ieee.org

Ambertec, P.E.P.C.

John Dunn – MSEE, PE

Member IEEE Consultants Network of Long Island
www.licn.org/Profile/JDunn

181 Marion Avenue

Merrick, NY 11566

Real Time Embedded - Financial Services - Transit
Architecture - Object Oriented Design - Java - C/C++
Full Stack - Internet of Things - Mobile Applications
Unix/Linux - Windows - Compilers - Communications



EARLY ELECTRONICS

Hardware / Software Consulting Services

Chris Early, BSEE, MSCS, PE
154 Hempstead Avenue
Rockville Centre, NY 11570

unixdev@ix.netcom.com
Voice: (516) 764-1067
Fax: (516) 764-1124

SIGNALS IN MOTION

Len Anderson
President



PHONE: 718-279-3953
FAX: 509-471-6496

E-MAIL: LenAnder@SignalsInMotion.com
WEBSITE: www.SignalsInMotion.com

BODNER & O'ROURKE, LLP
PATENTS, TRADEMARKS, COPYRIGHTS
AND RELATED MATTERS

GERALD T. BODNER
PATENT ATTORNEY

425 BROADHOLLOW ROAD, SUITE 120
MELVILLE, NY 11747
TEL: (631) 249-7500
FAX: (631) 249-4508
gbodner@bodnerorourke.com

ADVANCE IN TECHNOLOGY, INC.
Electronic Design — Analog, Digital, RF and Systems

JOHN LIGUORI
CEO, MSEE
631-865-2423

82 Westwood Avenue, Deer Park, NY 11729

www.advance-in-technology.com

JLiguori@advance-in-technology.com

Broad Shoulder Consulting LLC

Electronics, Mechanics, Optics, Software
www.broshoco.com

Special Expertise in Medical Imaging
System Design, Prototyping and Production
Serving Start-ups and Technology Investors

Dmitry Yavid
Founder
631-706-4696
dy@broshoco.com



Broad Shoulder Consulting, LLC
Long Island High Tech Incubator
25 Health Science Drive
Mail Box 320
Stony Brook, NY 11790-3350

Fred Katz Consulting, Inc.

93 Steven Place West Hauppauge, NY 11788

Proposals, Contracts & Specification Development
Innovative Creation, Electro-Mechanical
Analog & Digital Circuit/System Design
Wireless, Motion, Occupancy Sensors
System Analysis/Documentation
Commercial/Military Product Design
Sonar Systems and Acoustic Signal Processing
Security, Marine & Energy Saving, ROHS, UL Testing
Clever Inventions, Algorithm, IP & Patent Development



fred@fredkatzconsulting.com

www.fredkatzconsulting.com

Fred Katz
President

(631) 724-7702

Electronics
Consultant

Memberships: IEEE Senior Life Member, IEEE LI Consultants Network, LI Metal
Workers, Mensa Society, NYS Professional Inventors, Suffolk County Inventors

EXPERT WITNESS

TECHNICAL INVESTIGATOR

MARTIN KANNER AE, EE, MEE

PRODUCT LIABILITY
MACHINE INJURY

FIRE DAMAGE INJURY
LIGHTNING DAMAGE



sixxpoppy@juno.com

(516) 681-4346

POWER – CONTROLS DIV.
42 Glenwood Road
Plainview, NY 11803

EEDEngineering - Quality Software/Testing Solutions

Andrew Franklin Baxt
Managing Director of Engineering

Phone: 516-678-6563

Mobile: 561-558-3499

Oceanside, New York 11572

Andrew.Baxt@EEDEngineering.com

www.EEDEngineering.com

Carl Meshenberg

Technology Consulting Services

Electronic Product Development
Project Management
Marketing Strategies
Contract Development & Oversight

Mobile: 516 383-2595
carl.jmesh@gmail.com

**PROGRAMMING
PLUS®**

2503 AVENUE X
BROOKLYN, NY 11235

HARDWARE & SOFTWARE CONSULTING

- ADMINISTRATION
- DATABASES
- UNIX
- DEVELOPMENT
- NETWORKS
- LINUX
- ENGINEERING
- INTERNET
- VMS
- INTEGRATION
- SECURITY
- WINDOWS

For expert assistance, contact **Robert Weiner, EE, PE**, at:

Tel: (718) 648-6902 Email: info@progplus.com

Fax: (718) 648-7449 Web: www.progplus.com

**IEEE Consultants
Network of Long Island**

PO Box 411, Malverne NY 11565-0411

www.licn.org

(516) 379-1678

Be sure to visit our web Blog at:
licn.typepad.com/my_weblog



Affiliated with the Institute of Electrical
and Electronics Engineers, Inc.



John F. Vodopia, Esq.

Intellectual Property Law Firm

133C New York Avenue
Huntington, NY 11743

631-673-7555 ext: 5
631-327-6197 (Mobile)
631-425-7030 (Fax)

jvodopia@gmail.com
jvodopia@ieee.org



IEEE



LONG ISLAND SECTION



THE **PULSE**
OF LONG ISLAND