

IEEE IT Magazine

Steering Committee:

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Why an IT Magazine

Not only a glossy version of the Newsletter.

Goals:

- **Make IT content more visible**
- **Make IT content more widely accessible**
- **Highlight the interdisciplinary work of the community**

Measure:

- **Attract citations**

Why an IT Magazine

Publish:

- **Tutorial articles**
- **Tutorial special issues**
- **Columns, such as**
 - Perspectives from funding agencies (NSF, DARPA, ERC, Singapore panel, etc)
 - Perspectives from startups/industry
 - Across areas/across societies
 - IT impacts
 - Puzzle, cartoons, or games column
 - Teaching IT

Possible Timeline

- **Fall 2017:** submitted Letter of Intent
- **Before Sept 15, 2019:** Submit Phase I, get feedback from Proposal Development Committee (PDC) (we already have unofficial input from the PDC chair Ross Stone)
- **November 2019:** Phase I submission is discussed by the Periodicals Committee at the Technical Activities Board (TAB) Meetings - TAB decision
- **Before Dec 15, 2019:** Phase II submission to the Board
- **January 2020:** Finance Committee Decision
- **February 2020:** Phase II documents reviewed, TAB decision
- **July 2020:** fiscal year starts (approval to use funding)
- **March 2021: First publication!**

Highlights from Phase I Proposal

We cannot make Open Access:

Laura Creighton (IEEE) said that the reason IEEE decided in 2013 to not widely explore open access magazines are: 1) the perception was that the funders were not including magazines in their mandate for open access and 2) tutorial papers fees are less likely to come out from direct research grant.

Our model: Signal Processing Magazine

The committee thanks:

Jeff Andrews (IT), Robert Heath (SP EiC), several IT members for their input, Laura Creighton, Meena Shanmugavel, Ross Stone, Michael Werhman (IEEE)

Scope

The proposed **IEEE Information Theory Magazine** publishes content that spans from tutorials and review articles, to introductions to emerging topics, historical surveys and columns. The mission of the Magazine is to increase the visibility of the high quality content generated within the Information Theory Society, make it more accessible to a wide audience of scientists, engineers, researchers and educators, and highlight the rich interdisciplinary work of the community. The tutorial and review articles cover both traditional and emerging areas within the field of interest of the Society. The columns include topics of interest to the Society such as perspectives from funding agencies, startups and industry developments, puzzles and cartoons, reporting on events, and community updates.

Readership Survey

- **Conducted between June 13-June 27 2019**
- **Reached to approx. 50% of the 3000 IT members (excluded members recently surveyed + members who opted out of surveys).**
- **Results encouraging:**
 - **more than eight in ten (83%) said they were likely to read this publication**
 - **more than four in ten (42%) said they were likely to submit**
 - **more than three quarters (78%) indicate that the subject will be important in 10 years.**

Frequency and Page Counts

	# of print issues	Estimated # of tutorial articles	Estimated # of pages (including editorial/columns)
Year One	2	8	180
Year Two	2	10	220
Year Three	3	15	275

Tutorial Article Submissions

- **Advertise open call for submissions**
- **Encourage colleagues who present tutorials/plenary lectures to submit an associated article**
- **Invite best paper award winners to submit an associated article**
- **Advertise and accept submissions of special issues**

Technology Trends

- **Wireless:** as new wireless technologies emerge (mmWave, massive MIMO, energy harvesting), there is a clear need to understand fundamental limits as well as optimal strategies. Information theorists have traditionally contributed both fundamental limits and code designs for wireless, and several research areas in our community are aligned with these emerging new technologies.
- **Quantum Computers:** is a technology that is fast accelerating: for example, in June 2018, Intel began testing a silicon-based spin-qubit processor; in January 2019, IBM launched **IBM Q System One**, its first integrated quantum computing system for commercial use. Quantum error correction, quantum information theory, quantum communication, and quantum computation are all topics that our community helps advance.
- **Security:** with quantum computing increasingly attracting funding and attention from governments and large corporations, unconditional (information theoretic) security that does not depend on computational guarantees, becomes increasingly important. We are the core community with expertise in information theoretic security.
- **Cyber Physical Systems (CPS):** this includes critical infrastructure, such as the energy grid and self-driving vehicles, and is becoming increasingly important as we move towards a more technologically advanced society. Recent research has helped establish connections between CPS, control theory, and information theory.
- **Machine learning and Data Science:** is becoming wide spread, with deep learning penetrating applications that range from language processing to health monitoring. Information theorists have traditionally developed ideas and statistical tools that form the theoretical foundations of this area; more recent research has started addressing one of the “holy grails” in the area, providing a theoretical basis for deep learning.
- **Neuroscience:** with recent advances in devices that measure neural activity, understanding information transfer and processing in the brain can support a wealth of applications such as brain-computer interfaces for prosthetics. The Brain Initiative (<https://www.braininitiative.nih.gov>) is an example of a recent effort in understanding the human brain.
- **Genomics, Synthetic and Systems Biology:** as new methods to read DNA emerge, such as nanopore sequencing, and new applications emerge, such as information storage in DNA and molecular communication for biological circuits, researchers in information theory are contributing codes, algorithms and fundamental theoretical limits that help support this fast expanding area. Traditionally, information theorists have contributed to the computational and mathematical modeling of biological systems, and continue to do so.
- **Natural Language Processing (NLP):** this is an area to which information theory researchers as early as Shannon have contributed, and it has recently attracted significant new interest with the advance of automation and increased data availability.

Titles

This is IT:

The IEEE Information Theory Magazine

Read IT:

The IEEE Information Theory Magazine

IT Bits:

The IEEE Information Theory Magazine

Motions

- **Motion 1: Approve Submission of Phase I proposal by Sept. 15, 2019**
- **Motion 2: Approve the Magazine Title *****
- **Motion 3: Approve travel funding for a steering committee members to attend TAB meetings in November 2019 and February 2020.**

Next Steps

- **Prepare for Phase II: Administrative structure, bylaws, check interest of potential editors.**