ŞUAYB Ş. ARSLAN `<sarslan@mit.com>`

Cell: +1(617)4600913

Personal:www.suaybarslan.com

77 Massachusetts Avenue, Room 46-4089, Cambridge, MA, USA.   02139

RESEARCH OF INTEREST

Information–reliability–system theory, distributed systems, coding theory applications (neuroscience, machine learning, cloud computing), time-series analysis and modeling, federated machine learning, fault tolerant systems, network coding, distributed/decentralized architectures, parallel processing, IoT, wireless/wireline multimedia communications, optimizations, modeling using stochastic processes, cross-layer design, cloud storage for big data management/analytics, quantum information/computing.

ACADEMIC POSITIONS

Massachusetts Institute of Technology (Brain and Cognitive Sciences), *Cambridge, MA, USA*   *May. 2022-Current*
Visiting Professor, (`https://bcs.mit.edu/`)

Head of DSNS Lab, MEF University (Department of Computer Engineering), *Istanbul, Turkey*   *Mar. 2015-Mar. 2022*
Associate Professor, (`https://www.dsnslab.com`)

University of Nantes (LS2N), *Nantes, France*   *Dec. 2015, Jul. 2016*
Visiting Professor, (`https://www.ls2n.fr/membresequipe/rio/?lang=en`)

EDUCATION HISTORY

Graduate:

University of California, San Diego, (Department of Electrical & Computer Engineering), *La Jolla, CA, USA*   *Sept. 2006- March 2012*
Doctorate of Philosophy

- Thesis topic: "Bandwidth and Rate Allocation Tradeoffs of Source-Channel Coding, Packetization and Modulation in Unequally Protected Multimedia Communication Systems".
    Advisors:Prof. Pamela C. Cosman and Prof. Laurence B. Milstein.
- GPA: 3.8/4.00. (High Honors)

University of California, San Diego, (Department of Electrical & Computer Engineering), *La Jolla, CA, USA*   *March. 2009*
Master of Science

- Project Title: "Progressive Source Transmissions using Joint Source-Channel Coding (JSCC) and Hierarchical Modulation in Packetized Networks".
    Advisors:Prof. Pamela C. Cosman and Prof. Laurence B. Milstein.

Undergraduate:

Bogazici University (Department of Electrical & Electronics Engineering), *Sept 2003 - June 2006*
Rumeli hisar üstü, Istanbul, Turkey
Bachelor of Science

- Research concentration: "UWB Communications,Spread spectrum systems, Space Time block coding, Forward Error Correction (FEC) coding, Encrypted Mobile & Satellite communications/Networks".
- GPA: 3.85/4.00. (High Honors)
- Senior Project: Robust Receiver Design for Alamouti STB Coded UWB systems under Non- Gaussian Noisy Environment".
     Advisors: Assoc.Prof. Mutlu Koca and Prof. Hakan Delic.

Bogazici University (Department of Mathematics), *Rumeli hisar üstü, Istanbul,* *Sept 2002 - 2003*
Turkey
Bachelor of Science - *Transfer Student*

- Research interests: "Discerete Mathematics, Fields and Graph Theory".
- GPA: 3.84/4.00. (High Honors)

High School:

Kabatas High School, (Kabatas Erkek Lisesi), Ortaköy, Istanbul. *Sept 1997 - June 2001*

PREVIOUS RESEARCH EXPERIENCE

Department of Brain and Cognitive Sciences, Massachusetts Institute of *May. 2022 - present*
Technology, Cambridge, MA, USA
Visiting Professor, Sinha Lab

- Biometric Recognition and Identification at Altitude and Range (2022-2024). This work is supported by IARPA − US Goverment.
- Brain-Computer Interface design, brain channel characterization using artificial and biological neural networks. (Supported by TUBITAK 2219)
- Fundamental limits on the accuracy and information transfer rates for brain-computer interfaces.
- Bio-inspired Neural Networks for vision, integration, perception and cognition.

Department of Computer Engineering, MEF University, Maslak, Sariyer *Sept. 2015 - May 2022*
Associate Professor, Head of Distributed Systems Lab

- 5GFEDL: Federated Learning For Secure Private 5G Networks (supported by EU BOSPHORE-TUBITAK 2235 joint Program)
- Network coding for next generation cellular networks (supported by TUBITAK 1001).
- Development of a purely XOR-based erasure coding library Founsure that allows excellent repair and update features. (supported by TUBITAK 2232).
- Generalized reliability modeling for cold and warm data storage systems. (supported by Quantum Corporation, USA)
- Distributed implementation of machine learning and mix-integer programming problems. (supported by TUBITAK 3501)
- Writing joint research project proposals including BCI-powered spellers, drone and gaming applications, decentralized applications, clustering, coding theory, internet of things, etc. with internationally renown institutions. (supported by CHIST-ERA)

Advanced Development Lab., Quantum Corp., Irvine, CA *Sept. 2011 - present*
Principal R & D Design Engineer

- Extensive expertise on Error Correction Coding (ECC), efficient code design and decoding architectures, reliability estimations of Disk and Tape Drives.

- Extensive expertise on software-defined Cold & Cloud storage system design and rateless/network coding.
- Expertise on signal processing for communication/magnetic channel modeling.
- Design and analyze the constrained codes such as Run Length Limited (RLL) and Maximum Transition Run (MTR) codes.
- Design and implement improved detector/decoding architectures such as Viterbi, MAP and Belief Propagation. Design of reduced complexity soft decision algorithms such as Chase.
- Efficient and accurate data modeling for reliability performance predictions of tapes using hidden markov models.
- Efficient and accurate disk failure modeling for distributed storage.
- Submit patent applications for next generation Linear Tape Open (LTO) drives and propose innovative format changes with IBM and HP as copartners.
- Submit patent applications for next generation cloud systems using deduplication and fountain codes.
- Implementation of simple post-processor of tape–out data on multicore GPU chips using CUDA-C and CUDA-MEX (for Matlab).

Wireless Comm. Lab., UC San Diego, La Jolla, CA   *March 2007 - March 2012*
Graduate Student Researcher

- ◇ **ADVISORS**:Prof. Pamela C. Cosman and Prof. Laurence B. Milstein.
- Lossy and Lossless data compression techniques.
  - ◇ Image and Video source coding. Efficient entropy coding techniques.
- Joint Source-Channel coding and optimal packetization methodologies for multimedia.
- Hierarchical modulations for data transmission and storage for solid state drives.
- Cross layer optimization of multimedia communication systems.
- Efficient and capacity achieving coding techniques for multimedia storage and protection against noisy wireline and fade-dominated wireless channels.

Channel Group, Quantum Corp, Irvine, CA.   *June 2011 - Sept. 2011*
Research Intern

- ◇ **SUPERVISORS**: Turguy Goker, Dr. Jaewook Lee
- Error Event Study for noise predictive maximum likelihood detection algorithms for tape drives.
- Development of List-Noise predictive maximum likelihood detection (List-NPMLD) algorithm based on periodic error detections for magnetic recording channels.
- Post-ECC performance evaluation based on low complexity estimation algorithms and the quantification of the Post-ECC SNR gains using various detection algorithms.

Imaging Group, Mitsubishi Electric Research Lab., Cambridge, MA.   *May 2009 - Sept 2009*
Research Intern

- ◇ **SUPERVISOR**: Dr. Fatih Porikli
- Development of a fast C-MEX based tissue simulation program using bi-cubic interpolation methods and a Finite Element Method for object morphing (a tumor in our case) for a given 3D volume.
- Image and Video processing algorithm development, generating synthetic images for tracking a visible or an invisible object,
- Optimum spectral clustering for large dimensional data, robust nonlinear least squares regression for the improvement of segmentation algorithms,
- Unsupervised multilevel segmentation algorithm based on confidence maps based on a set of random seed allocations,
- 2D texture coding and tracking based on a subgroup of general linear group theory. Application to more complex motion models such as bilinear or planar surface flow models.

Transmission department of Turk Telekom A.S., Istanbul, Turkey   *June - Sept. 2005*
Coordinator & Engineer Intern

- Analyzed DWDM technology(Optical Networking) to increase the maximum multiple access under

the given tolerable interference.
- Development of techniques used in analysis of SONET & SDH technologies.

TEACHING EXPERIENCE

Sabanci University, Istanbul, Turkey.
Instructor

- **ENS 211**: *Signals* Summer 2018. `http://www.suaybarslan.com/teaching/ens211.html`

MEF University, Istanbul, Turkey.
Instructor

- **ITC 501**: *Probability and Random Processes* Fall'18. (Graduate)
- **ITC 515**: *Quantum Computing* Fall'19,'20,'21. (Graduate)
- **MATH 224**: *Probability and Statistics* Spring'16,'17,'18,'19,'20.
- **COMP 465**: *Fundamentals of Quantum Computing* Fall'20,'21.
- **COMP 206**: *Computer Architecture* Spring'16,'17,'18,'19,'20.
- **COMP 472**: *Parallel and Distributed Systems* Fall'17,'18,'19.
- **EE 203**: *Digital System Design* Fall'16,'17,'18,'19,'20,'21.
    More information about classes can be found at `http://suaybarslan.com/teaching.html`.

Channel Group, Quantum Corp, Irvine, CA.
Instructor

- **ECC 101:** *Fundamentals of Coding Theory* Summer 2013.
    Algebraic and probabilistic codes and their performances.
    Some of the class notes can be found at `http://suaybarslan.com/teaching.html`.

University of California, San Diego, La Jolla, CA
Teaching Assistant

- **ECE** 53: *Fundamentals of Electric Circuits* Electrical & Computer Engineering, UC San Diego,CA, **INSTRUCTOR**: Prof. Pamela Cosman, Fall 2009.
- **ECE** 258B: *Digital Communications* Electrical & Computer Engineering, UC San Diego,CA, **INSTRUCTOR**: Prof. Laurance Milstein, Spring 2008. (Graduate)
- **ECE** 154A: *Communications Systems I* Electrical & Computer Engineering, UC San Diego, CA, **INSTRUCTOR**: Prof. Laurance Milstein Fall 2007.
- **EE** 374: *Communication Engineering* Electrical & Electronics Engineering, Bogazici University, Turkey, **INSTRUCTOR**: Asistant Prof. Mutlu Koca, Oct. 2007.

    I host a Youtube channel dedicated to teaching.
    Available Online: `https://www.youtube.com/channel/UCbj6XVuhUh6ZTkpwcne5eWQ`

PUBLICATIONS

- *Publication record and citation information available online:*
`http://scholar.google.com/citations?user=Tjrq9YEAAAAJ&hl=en`

Thesis:

- **S. S. Arslan**, "Bandwidth and Rate Allocation Tradeoffs of Source-Channel Coding, Packetization and Modulation in Unequally Protected Multimedia Communication Systems" Ph.d. Thesis, Department of Electrical and Computer Engineering, University of California, San Diego, March 2012, Advisor: Prof. Pamela Cosman, Coadvisor: Prof. Laurence Milstein.
    Available Online: `http://www.escholarship.org/uc/item/97c3938x`

Papers under revision:

- **S. S. Arslan**, and P. Sinha, "On the Information Transfer Rate for BCI Applications," Submitted to *IEEE Trans. Biomedical Engineering,* 2022.
- **S. S. Arslan**, "Guessing Cost with Stopping: Data Regeneration in Cellular Networks," *IEEE Communications Letters*, submitted. 2022.
- **S. S. Arslan** and E. Haytaoglu, "Cost of Guessing: Applications to Distributed Data Storage and Repair". Submitted to IEEE Transactions on Information Theory, 2020. under review. **Available Online:** `https://arxiv.org/abs/2005.06666`
- B. Confais, **S. S. Arslan**, B. Parrein, "SToN: A New Fundamental Trade-off for Distributed Data Storage Systems," under revision, *IEEE Trans. Network and Service Management*, 2020.
- M. Yagan, S. Musellim, **S. S. Arslan** and H. Ozkan, "A Benckbark Dataset towards Ubiquitous P300 ERP-based BCI Applications", IEEE Access , (under revision) 2021.
- **S. S. Arslan**, "Incremental Redundancy, Fountain Codes and Advanced Topics", in submission, *IEEE Communications Surveys and Tutorials*. This is a comprehensive study. Initial Version is available at *http://suaybarslan.com/FountainCodes.pdf*.

Editorials:

- **S. S. Arslan**, R. Jurdak, J. Jelitto and B. Krishnamachari,"Advancements in Distributed Ledger Technology for Internet of Things," *Internet of Things*, Elsevier, (2020): 100114.

Refereed Journal Papers:

- **S. S. Arslan** "Optimal Data Decoding Strategies for Product–Coded Sequential Media Recording Through Latin Squares", accepted to *IEEE Transactions on Magnetics*, 2022. doi: 10.1109/TMAG.2022.3218757
- **S. S. Arslan** and T. Goker, "Compress-Store on Blockchain: A Decentralized Data Processing and Immutable Storage for Multimedia Streaming," accepted to *Cluster Computing* Cluster Comput 25, 1957–1968 (2022).
- E. Haytaoglu, E. Kaya and **S. S. Arslan**, "On the Fault Tolerant Distributed Data Caching using LDPC Codes in Cellular Networks", *IEEE Transactions on Communications*, vol. 70, no. 1, pp. 19-31, Jan. 2022. **Available Online:** `https://arxiv.org/abs/2010.14781`
- **S. S. Arslan**, "Array BP-XOR Codes for Parallel Matrix Multiplication using Hierarchical Computing," accepted, *IEEE Transactions on Information Theory,* 2022. **Available Online:** `https://arxiv.org/abs/1904.11563`
- **S. S. Arslan**, "Exact Construction of BS-assisted MSCR codes with Link Constraints," in *IEEE Communications Letters*, vol. 26, no. 2, pp. 225-228, Feb. 2022
- **S. S. Arslan**, "Founsure 1.0: An erasure code library with efficient repair and update features," *SoftwareX*, vol. 13, p. 100662, 2021. **Available Online:** `https://arxiv.org/abs/1702.07409`
- **S. S. Arslan** and E. Zeydan, "On the Distribution Modeling of Heavy-Tailed Disk Failure Lifetime in Big Data Centers," in *IEEE Transactions on Reliability*, vol. 70, no. 2, pp. 507-524, June 2021.
- **S. S. Arslan**, J. Peng, and T. Goker. "A data-assisted reliability model for carrier-assisted cold data storage systems." *Reliability Engineering & System Safety* 196 (2020): 106708.
- R. Ashrafi, **S. S. Arslan**, and A. E. Pusane. "On the distribution of the threshold voltage in multi-level cell flash memories." *Physical Communication* (2019): 100747.
- **S. S. Arslan**, "A Reliability Model for Dependent and Distributed MDS Disk Array Units," in *IEEE Transactions on Reliability*, vol. 68, no. 1, pp. 133-148, March 2019
- O. Narmanlioglu, E. Zeydan and **S. S. Arslan**, "Service-Aware Multi-Resource Allocation in Software-Defined Next Generation Cellular Networks," in *IEEE Access*, vol. 6, pp. 20348-20363, 2018.
- **S. S. Arslan**, Jaewook Lee, Jerry Hodges, James Peng, Hoa Le and Turguy Goker, "MDS Product Code Performance Estimations under Header CRC Check Failures and Missing Syncs", *IEEE Transactions on Device and Materials Reliability* Vol. 14, No. 3, pp. 921-930, Sept. 2014.

- **S. S. Arslan**, "Redundancy and Aging of Efficient MDS–Parity Protected Distributed Storage Systems," *IEEE Transactions on Device and Materials Reliability*, Vol. 14, No. 1, pp. 275-285, Mar. 2014.
- **S. S. Arslan**, J. Lee and T. Goker, "Cycle Slip Detection and Correction through Classification of Run Length Limited Code Failures," *IEEE Transactions on Magnetics*, Vol. 49, No. 9, pp. 4988-4998, Sept. 2013.
- **S. S. Arslan**, J. Lee and T. Goker, "Error Event Corrections Using List-NPMLD Decoding and Error Detection Codes," *IEEE Transactions on Magnetics*, Vol. 49, No. 7, pp. 3775–3778, July 2013.
- **S. S. Arslan**, P.C. Cosman, and L.B. Milstein, "Concatenated Block Codes for Unequal Error Protection of Embedded Bit Streams," *IEEE Transactions on Image Processing*, Vol. 21, No. 3, pp. 1111-1122, March 2012.
- **S. S. Arslan**, P.C. Cosman, and L.B. Milstein, "Coded Hierarchical Modulation for Wireless Progressive Image Transmission," *IEEE Transactions on Vehicular Technology*, vol.60, no.9, pp. 4299-4313, Nov. 2011.
- **S. S. Arslan**, P.C. Cosman and L.B. Milstein, "Generalized Unequal Error Protection LT Codes for Progressive Data Transmission," *IEEE Transactions on Image Processing*, Vol. 21, No. 8, pp. 3586-3597, August 2012.

Refereed Conference Papers:

- A. Sayar, **S. S. Arslan** and T. Cakar, "SSQEM: Semi-Supervised Quantum Error Mitigation," 2022 *7th International Conference on Computer Science and Engineering (UBMK)*, 2022, pp. 474-478.
- E. Ertekin, B. B. Gunden, Y. Yilmaz, A. Sayar, T. Cakar and **S. S. Arslan**, "EMG-based BCI for PiCar Mobilization," 2022, *7th International Conference on Computer Science and Engineering (UBMK),* 2022, pp. 496-500.
- **S. S. Arslan** and E. Haytaoglu."Improved Bounds on the Moments of Guessing Cost", *IEEE International Symposium of Information Theory*, Finland, 2022, pp. 3351-3356.
- **S. S. Arslan**, M. Pourmandi and E. Haytaoglu. "Cooperative Network Coding for Distributed Storage using Base Stations with Link Constraints", *IEEE International Symposium of Information Theory*, Finland, 2022, pp. 3351-3356.
- E. Kaya, M. Pourmandi, E. Haytaoglu and **S. S. Arslan**, "Residual Data Usage in LDPC Codes ," 2022, *30th Signal Processing and Communications Applications Conference (SIU)*, 2022, pp. 1-4.
- O.B.Guney, C. Aksoy, E. Koc, Y. Catak, **S. S. Arslan** and H. Ozkan, "DSA Topluluklarinin Beyin-Bilgisayar Arayuzleri icin Uyarlamali Guclendirilmesi", *IEEE Signal Processing and Communications Applications Conference (SIU)*, Accepted, 2021.
- M. Pourmandi, A.C. Tengiz, E. Haytaoglu, **S.S. Arslan** and A. E. Pusane, "Average Bandwidth-Cost v.s. Storage Trade-off for BS-assisted Distributed Storage Networks," *IEEE Signal Processing and Communications Applications Conference (SIU)*, Accepted, 2021.
- **S. S. Arslan** and E. Haytaoglu, "Cost of Guessing: Applications to Data Repair," *IEEE International Symposium on Information Theory (ISIT)*, Los Angeles, CA, USA, 2020, pp. 2194-2198.
- E. Kaya, E. Haytaoglu and **S. S. Arslan**, "Data Repair in BS-assisted Distributed Data Caching," *28th IEEE Signal Processing and Communications Applications Conference (SIU)*, Gaziantep, Turkey, 2020.
- O. B. Guney, M. Oblokulov and **S. S. Arslan**, "Fault-Tolerant Strassen-Like Matrix Multiplication," *28th IEEE Signal Processing and Communications Applications Conference (SIU)*, Gaziantep, Turkey, 2020.
- E. Zeydan, **S. S. Arslan**, "Cloud^2 HDD: Large-Scale HDD Data Analysis on Cloud for Cloud Data Centers" *23rd IEEE Conference on Innovation in Clouds, Internet and Networks and Workshops (ICIN)*, Paris, France, Feb., 2020.
- **S. S. Arslan**, "Distributed Matrix Multiplication with Array MDS BP-XOR Codes for Scaling Clusters," *IEEE International Conference on Information Theory (ISIT)*, Paris, France, 2019.
- R. A. Ashrafi and A. E. Pusane and **S. S. Arslan**, "Kernel Density Estimation for Optimal Detection in All-Bit-Line MLC Flash Memories," *27th IEEE Signal Processing and Communications Applications Conference (SIU)*, Sivas, Turkey, 2019.

- O. Yigit and **S. S. Arslan** "Disk Hasarlarinin Analizi ve Tahmini icin Bir Veri Analitigi Platformu" *2nd International Conference on Data Science and Applications, (ICONDATA)*, Edremit, Turkey, 2019.
- O. B. Guney and **S. S. Arslan**, "Error Correction Output Codes: Overview,Challenges and Future Trends," *27th IEEE Signal Processing and Communications Applications Conference (SIU)*, Sivas, Turkey, 2019.
- **S. S. Arslan**, "Asymtotically MDS BP-XOR Codes," *IEEE International Conference on Information Theory (ISIT)*, Vail, Colorado, USA, 2018, pp. 1-5.
- O. Susam and **S. S. Arslan**, "Parallelization and Performance Analysis of Reversible Circuit Synthesis," *26th IEEE Signal Processing and Communications Applications Conference (SIU)*, Izmir, Turkey, 2018.
- R. A. Ashrafi and A. E. Pusane and **S. S. Arslan**, "Next-Generation Data Storage: Transistor and DNA," *26th IEEE Signal Processing and Communications Applications Conference (SIU)*, Izmir, Turkey, 2018.
- I. O. Yigit, **S. S. Arslan** and E. Zeydan, "A Visualization Platfom for Disk Failure Analysis," *26th IEEE Signal Processing and Communications Applications Conference (SIU)*, Izmir, Turkey, 2018.
- G. B. Mermer, E. Zeydan and **S. S. Arslan**, "An Overview of Blockchain Technologies:Principles, Opportunities and Challenges," *26th IEEE Signal Processing and Communications Applications Conference (SIU)*, Izmir, Turkey, 2018.
- **S. S. Arslan**, Hoa Le, Joe Landman and Turguy Goker, "OpenMP and POSIX Threads Implementation of Jerasure 2.0," *6th IEEE Blacksea Conference*, Istanbul, Turkey, 2017.
- **S. S. Arslan**, Rod Wideman and Turguy Goker, "A joint dedupe-fountain coded archival storage," *IEEE International Conference on Communications (ICC),* 2017, pp. 1-7, Paris, France.
- **S. S. Arslan**, Benoit Perrain and Nicolas Normand, "LDPC Interpretation of Mojette Transform based Erasure Correction Codes," *25th IEEE Signal Processing and Communications Applications Conference*, Antalya, Turkey, 2017
- **S. S. Arslan**, "Implementation of Multi-threaded Erasure Coding under Multi-Processing Environments", *24th IEEE Signal Processing and Communications Applications Conference*, Zonguldak, Turkey, 2016.
- **S. S. Arslan**, "Minimum distortion variance concatenated block codes for embedded source transmission," *2014 International Conference on Computing, Networking and Communications (ICNC)*, 2014, pp. 386-392, (acceptance rate < 25%), Available Online: *arXiv:1210.2815v1 [cs.MM] 2012*.
- **S. S. Arslan**, J. Lee and T. Goker, "Embedding Noise Prediction into List-Viterbi Decoding using Error Detection Codes for Magnetic Tape Systems," *In proceedings of the ASME 2013 Conference on information storage and processing systems*, Jun. 24-25, Santa Clara, CA, USA, 2013.
- **S. S. Arslan**, P.C. Cosman, and L.B. Milstein, "Optimization of Generalized LT Codes for Progressive Image Transfer," *VCIP 2012*, San Diego. (Finalist, Best Paper Award)
- **S. S. Arslan**, P.C. Cosman, and L.B. Milstein, "On hard decision upper bounds for coded M-ary hierarchical modulation," *IEEE Conference on Information Sciences and Systems*, Baltimore, MD, USA, 2011.
- M. Hussein, F. Porikli, R. Li and **S. S. Arslan**, "CrossTrack: robust 3D tracking from two cross-sectional views," *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Colorado springs, CO, USA, 2011.
- **S. S. Arslan**, P.C. Cosman, and L.B. Milstein, "Progressive Source Transmissions using Joint Source-Channel Coding and Hierarchical Modulation in Packetized Networks," *IEEE Globecom 2009*, Hawaii, USA.

For more info: `http://suaybarslan.com/researchpub.html`

Poster presentations, Seminars & Invited talks:

- S. S. Arslan "Recent advancements in Guessing with applications to distributed storage and machine learning" Invited Speech at 10th ICCCM 2022.
- S. S. Arslan "Quantum Communications", Annual IEEE ComSoc Conference, 2020.
- S. S. Arslan "Network, Cloud and Fog: Next Generation IoT", Annual IEEE ComSoc Conference, 2019.

- S. S. Arslan, "Asymptotically MDS Array BP-XOR Codes for Distributed Data Storage and Coded Computation", *Koc University, March 2019*.
- S. S. Arslan, "Mojette Transform Codes as Array MDS BP-XOR Codes", *Mojette Day, 2018, Nantes, France*.
- S. S. Arslan, "Mojette Transform Codes as LDPC codes in storage", *University of Nantes, June. 2016*.
- S. S. Arslan, "The Evolution of Erasure Codes for Large Scale Data Storage and Multimedia Broadcast", *Bahcesehir University, Sept. 2013*.
- S. S. Arslan, "Magnetic Tape Recording: Future Projections, Challenges and Quantum's Research Focus", *Bogazici University, Jan. 2013*.
- S. S. Arslan "Challenges of Tape Recording: Past and Present", *Bilkent University, Feb. 2013*.
- S. S. Arslan, J. Lee and Turguy Goker, "Error Event Corrections Using List-Noise Predictive Maximum Likelihood Decoding and Error Detection Codes", *12th IEEE International Magnetics Conference, Chicago, IL. USA, Jan. 2013*.
- S. S. Arslan, P.C. Cosman, and L.B. Milstein "Concatenated Coding for Embedded Bit streams " *Center for Wireless Communications (CWC) Research Review*, UC San Diego, La Jolla, 2011. **Available Online:** `http://www.youtube.com/watch?v=mstIuokbQX0`
- S. S. Arslan and Fatih Porikli, "Tumor Segmentations and Tracking (Visible/Invisible), *MERL Imaging Workshop*, Cambridge, MA, Sept 2009.
- S. S. Arslan, "Novel Ideas in Multiple Description Coding", *Network Information Theory mini-Workshop*, Calit2, UC San Diego, La Jolla, June ,2007.

Patents (Grant Publications - Not comprehensive):

- T. Goker, S. S. Arslan, H. Le, J. Peng, C. Prigge, "Erasure Coding Magnetic Tapes for Minimum Latency and Adaptive Parity Protection Feedback", **US11216196 B2**, (Date: Jan 4, 2022)
- R. B. Wideman, T. Goker and S. S. Arslan, "Removable media based object store", **US11042299 B2**, (Date: June 22, 2021)
- S. S. Arslan, T. Goker and R. B. Wideman "Joint De-Duplication-erasure coded distributed storage", **US10853187 B2**, (Date: Dec 1, 2020)
- S. S. Arslan, T. Goker and J. Lee "Efficient data storage across multiple storage volumes each representing a track of a larger storage volume", **US10698616 B2**, (Date: Jun 30, 2020)
- J. P. Peng, T. Goker, H. Le, S. S. Arslan, G. A. Saliba, "Diagnostic Tape Cartridge Patterned with predetermined head-media spacings for testing a tape head of a tape drive", **US10559332 B2**. (Date: Feb 11, 2020)
- R. Wideman, S. S. Arslan, J. Lee and T. Goker, "Data Deduplication with adaptive Erasure Code Redundancy", **US10484016 B2, US9692452 B2, US9503127 B2**. (Date: Nov 19, 2019)
- S. S. Arslan and T. Goker, "High/low energy zone data storage", **US10114692 B2**.
- S. S. Arslan, T. Goker, J. Lee and H. Le, "System and Method for Tape Layout Optimization", **US10014025 B2, US10319406 B2**. (Date: Jun 11, 2019)
- S. S. Arslan and T. Goker, "Adaptive Erasure Codes", **US10044374 B2**. (Date: Aug. 7, 2018)
- S. S. Arslan and T. Goker, "Power savings in cold storage", **US9965351 B2**. (Date: May. 8, 2018)
- S. S. Arslan and T. Goker, "Efficient High/low energy zone solid state device data storage", **US10114692 B2, US9846613 B2**. (Date: Oct. 30, 2018)
- T. Goker, S. S. Arslan, D. Doerner and H. Le, "Doubly distributed erasure codes", **US9431054 B2** (Date: Aug. 30, 2016)

Patents (Application Publications - Not comprehensive):

- S. S. Arslan, T. Goker and J. Lee "Data storage across simplified storage volumes", **20200117375 A1**.
- T. Goker, S. S. Arslan H. Le, J. Peng and P. Carsten, "Erasure Coding Magnetic Tapes for Minimum Layency and Adaptive Parity Feedback", **20190361606 A1**.
- J. Peng, T. goker, H. Le, S. Arslan, G.A.Saliba "Diagnostic Tape Cartridge Patterned with Predetermined Head-Media Spacings for Testing a Tape Head of a Tape Drive", **20190221234 A1**.
- S. S. Arslan, T. Goker, J. Lee and H. Le, "System and Method for Tape Layout Optimization", **20190027186 A1**.

- T. Goker, J. Lee, H. Le, S. Arslan, J. Peng "Network Attached Device for Accesing Removable Storage Media", **20180302473 A1**.
- T. Goker, J. Lee, H. Le, S. S. Arslan and J. Peng, "Efficient Data storage across multiple storage volumes", **20180302473 A1**.
- S. S. Arslan and T. Goker , "Power savings in cold storage", **20180225172 A1**.
- S. S. Arslan, T. Goker and J. Lee, "Efficient Data storage across multiple storage volumes", **20180136857 A1**.
- S. S. Arslan, T. G. Goker and Rod Wideman, "Joint de-duplication-erasure coded distributed storage", **US 20180018235 A1**.
- Rod Wideman, T. G. Goker and S. S. Arslan, "Removable media based object store", **US20170371543 A1**.
- R. Wideman, S. S. Arslan, J. Lee and T. Goker, "Data Deduplication with adaptive Erasure Code Redundancy", **US20160013815 A1**.
- S. S. Arslan and T. Goker, "Adaptive Erasure Codes", **US 20170033806 A1**.
- S. S. Arslan and T. Goker, "High/low energy zone data storage", **US20160218751 A1**.
- S. S. Arslan and T. Goker, "Power savings in cold storage", **US20160217823 A1**.
- S. S. Arslan and T. Goker, "Efficient High/low energy zone solid state device data storage", **US20160217031 A1**.
- S. S. Arslan, J. Lee and T. Goker, "Bit Error Detection and Correction with Error detection code and List-NPMLD", **US 20140173381 A1.**

(**You can get more detail from the USPTO web page:** `http://patft.uspto.gov/`)

Other Joint Research Projects Involved:

- IBM, HP and QTM – Joint Development Agreement (JDA), "Logical TWG for next generation LTO format", *2012-2016*.
- Jieun Oh, HyeGyeong Park, JS Ha and Jae Moon, "RS-LDPC concatenation: Simulation and Performance evaluation for the Tape Channel", A project funded by Information Storage Industry Consortium (INSIC), 2013.

Funding Organizations:

- 2022-present, GE Electric & US Government.
- 2019-present, TUBITAK 1001, 3501, 2219.
- 2020, 2022 - FulBright Turkey.
- 2016, MEF University BAP & EU Horizon 2020 & TUBITAK 2232.
- 2013, Hewlett-Packard Development Company, L.P.,
- 2013, Quantum Corporation, Irvine, CA,
- 2012, LG Electronics Inc., San Diego, CA
- 2006–2009, Intel Inc., Portland, OR
- 2006–2011, The Center for Wireless Communications at the University of California at San Diego,
- 2006–2011, The University of California Discovery Grant Program of the state of California,
- 2006–2011, The National Science Foundation (NSF) under Grant CCF-0915727.
- 2006 UCSD ECE Supplemental Departmental Fellowship. (Graduate studies)
- 2006 TUBITAK fellowship. (Graduate studies)

PROFESSIONAL SERVICES

- **Editor** IEEE Data Storage Technical Committee Newsletter, 2022.
- **Treasurer** IEEE Data Storage Technical Committee, 2021.
- **Vice-Chair** IEEE ComSoc Turkey, 2021-today.
- **Track Chair** Data Storage and Cloud Computing Track, IEEE ICC 2021.
- **Track Chair** Data Storage Track Special Session, IEEE SIU 2020.

- **Associate Editor** Elsevier book series: "Intelligent Data-Centric Systems: Sensor Collected Intelligence" online: https://www.elsevier.com/books-and-journals/book-series/intelligent-data-centric-systems-sensor-collected-intelligence.
- **Associate Editor** Bulletin of Electrical Engineering and Informatics (BEEI), iaes, 2019-2022.
- **Associate Editor** Internet of Things JOURNAL, ELSEVIER, 2018-2021. (IF:5.7)
- **Award Committee Member** IEEE ComSoc Student Competition, 2018-Today.
- **Active Committee Member** IEEE DSTC, 2018-2021.
- **Industry Member** INSIC Consortium, 2013-2018 (Tape Format Technical Team).
- **Session Chair** IEEE ICC 2017 – Data Storage Track.
- **Technical Program Committee (TPC) Member** IEEE ISITA 2020, IEEE GLOBECOM {2016 – 2020}, ICC {2017 – 2020} – Data Storage Track, VTC {2020} – All tracks.
- **Technical Program Committee (TPC) Member** ICW-TELKOMNIKA 2018, ICRAMET 2018, EIDWT 2018, ICN 2018, INNOV 2018, INAIT 2019, ICSCC 2019, EIDWT 2019, INNOV 2019.
- **Special Session Chair** IEEE SIU {2017, 2018, 2019} – Signal Processing and Coding for Data Storage and Computing Systems.
- **Refree & Panelist & Panel Moderator,** TUBITAK TEYDEB and 1001, 1003 Calls (2017–present).
- **External Consultant,** TUBITAK 1001, 1003, 2538 TUBITAK-RaEng Calls (2018–present).
- **Refree,** TUSIAD-TUBITAK 13th Technology Awards (2018).
- **Refree,** CONICYT FONDECYT-CHILE Calls (2018–present).
- **Founding Academic Member,** MEF University, Turkey. (2015-Present).
- **Consultant,** Quantum Corp. USA, (2015-Present).
- **Consultant,** Huawei Technologies Co. Ltd. Turkey, (2016).
- **Quantum representative**, SNIA, Linear Tape Open (LTO) Technology, Logical TWG 2014.
- **Reviewer**, IEEE TRANSACTIONS ON MAGNETICS. {2013-present}
- **Reviewer**, ELSEVIER JOURNAL OF PHYSICAL COMMUNICATION. {2013-present}
- **Reviewer**, IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS. {2012-present}
- **Reviewer**, IEEE TRANSACTIONS ON COMMUNICATIONS. {2012-present}
- **Reviewer**, IEEE COMMUNICATION LETTERS. {2012-present}
- **Reviewer**, IEEE TRANSACTIONS ON IMAGE PROCESSING. {2010-present}
- **Reviewer**, HINDAWI PUBLISHING CORPORATION, "Journal of Electrical and Computer Engineering" {2009-present}
- **Reviewer**, IEEE TRANSACTIONS ON VEHICULAR TECHNOLOGY. {2009-present}

AWARDS & HONORS

- Finalist, **IEEE ComSoc Turkey Best Paper Award**, IEEE SIU'21.
- **Distinguished Researcher Award** from London Journals Press (UK), recognized as honorary Rosalind Member of LJP, 2020. (ID# TL40779)
- **Publication Incentive Awards**, TUBITAK, 2016-2020.
- **Visiting Scholar Awards**, LS2N (2015), Fullbright (2022), TUBITAK 2219 (2021).
- **Lifetime Achievement Award**, Marquis Who's Who, 2018-2020.
- **HORIZON 2020 Above-Threshold-Award**, TUBITAK, 2017-2018.
- Recipient of **Quantum Outstanding Research Award**, Dec. 2012, Nov. 2013, Dec. 2014.
- Finalist, **Best Paper Award**, VCIP 2012.
- Intel and LG Electronics (LGE) Research fellow during the graduate study at UC San Diego.
- Recipient of ECE departmental **Fellowship** Supplement, University of California, San Diego (July 2006).
- Selected for the **Dean's office high honor list** in all semesters completed in Bogazici University (2002-2006) and 5th standing in 2006 graduates of engineering faculty.
- Recipient of **Fellowship** of US $ 35,000 by TUBITAK, (2006)
- **First** standing in Department of Mathematics, Bogazici University.(June-2002).

SPECIAL SKILLS

Language:

- Turkish (native), English (fluent), French(fair), Spanish(Beginner)

Computer Software:

- C, C++, Python, C-MEX, CUDA C-MEX, R, QT C++, LaTeX, Visual Basic, Javascript editor, HTML, Microsoft Outlook Express, Macromedia Fireworks, Swish, Corel Draw, Wings3D, Macromedia Dreamwaver , Videowave, Lightwave 3D, Ms-Dos, Microsoft Office tools.

Artificial Intelligence:

- Tensorflow, Keras, PyTorch, Numpy, Scipy, Pandas, Scikit-learn, FedML, Specktral, Psychopy.

Simulation Software:

- Matlab, DesignLab, NS-3, Pspice, NVIDIA's CUDA SDK, Multism, Modelsim, Catapult, Labview.

Other:

- Jerasure 2.0, ISA-L, Founsure 1.0, PyTorch, TensorFlow, H.264/AVC, MPEG 2 Part 2/10, EZW, SPIHT, JPEG2000, SDMP programming, openMP, openMPI, Linux device drivers, Random walker & Graphcut segmentation algorithms, Adaboost, SVM, Histogram classification, All channel coding algorithms (Linear block codes like Reed-solomon codes, Convolutional codes, Turbo codes, LDPC, IRA, Online, LT, Raptor, etc...), Linear Tape Open (LTO) Format, Distributed Storage Systems, ML (Noise predictive and list architectures) and MAP detectors, 60–GHz channel modeling with link breaks, Linear/Dynamic Programming, CDMA, LTE, WiMax.

PROFESSIONAL MEMBERSHIPS

- IEEE, Senior Member (16th year),
- Sigma Xi, Associate Member (12th year),
- IEEE Information Theory Society, (5th year)
- IEEE Communications Society, (8th year)
- IEEE Computer Society, (1st year)
- INSIC, Industry Member (8th year),
- ASME, Member (7th year)
- SNIA, Industry Member (6th year),