# Curriculum Vitae

O. Ozan Koyluoglu

## Contact Information

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## Education

**The Ohio State University**, Columbus, OH
*Ph.D. in Electrical and Computer Engineering* **Dec. 2010**
(GPA: 3.98/4.00, GPA in major: 4.00/4.00)

*M.S. in Electrical and Computer Engineering* **Jun. 2007**
(GPA: 3.96/4.00, GPA in major: 4.00/4.00)

**Bilkent University**, Ankara, Turkey
*B.S. in Electrical and Electronics Engineering* **May 2005**
(GPA: 3.89/4.00, GPA in major: 4.00/4.00)

## Professional Experience

**Huawei**, Santa Clara, CA
*Staff Researcher* **Jan. 2017 – present**
Member of Future Networks Group.

Driving the research, innovation and promotion for future technologies. In particular, research on artificial intelligence and machine learning for next generation communication networks.

**University of California, Berkeley**, Berkeley, CA
*Visiting Scholar* **Jan. 2017 – present**
Department of Electrical Engineering and Computer Science.

Focusing on information and communication technologies. In particular, research on distributed storage and computing systems.

**The University of Arizona**, Tucson, AZ
*Assistant Research Professor* **Jan. 2017 – present**
Department of Electrical and Computer Engineering.

*Assistant Professor* **Aug. 2013 – Jan. 2017**
Department of Electrical and Computer Engineering.

*Assistant Professor* **Dec. 2014 – Jan. 2017**
Graduate lnterdisciplinary Program in Applied Mathematics.

Research in information and coding theory, communications, statistics, and neuroscience with special emphasis on networks, security, and neural coding problems.

- Publication activity includes 10 journal paper submissions, 1 journal paper, 20+ conference papers.
- Proposal activity includes a total of 27 proposal submissions with 3 awarded NSF grants, 4 individual NSF submissions including two awarded grants, 5 collaborative NSF submissions with UA collaborators (lead PI in 2 of them), 6 collaborative NSF submissions including outside collaborators (lead PI in 3 of them), 5 white papers to Cisco, NSF, ONR, AirForce, 1 QNRF collaborative proposal (lead PI), 1 Simons foundation collaborative neuroscience proposal (lead PI), 1 KECK Foundation proposal, 1 DoD OSD SBIR, 1 NSF STTR, 1 individual proposal to UA-OVPR faculty seed grants, 1 collaborative proposal to UA-CIS (Center for Insect Science).

Teaching

- Courses taught include information theory, detection and estimation, coding theory, communications, and computational neuroscience.
- Supervision of 11 students including 3 PhD students, 3 MS students, 2 undergraduate students, 2 temporary graduate associates, 1 international visitor.

Service

- Departmental committee memberships, editorship at IEEE Transactions on Wireless Communucations, organizing and technical program committee memberships (ICC, INFOCOM, ISIT, ITW).

**The University of Texas at Austin**, Austin, TX
*Postdoctoral Fellow* **Jan. 2011 – Aug. 2013**
Member of Wireless Networking and Communications Group.

Research in the areas of information theory, coding theory, security, and neuroscience; focusing on codes for wireless networks, information theoretic security, coding for distributed storage systems, and neural coding for memory and spatial navigation (4 journal papers, 13 conference papers). Worked with 8 graduate associates. Conducted joint projects with Samsung Korea (on novel codes for wireless channels) and Huawei Dallas R&D (on codes for memory systems). Guest lecturer in information theory class. Organized discussion sessions to enhance teamwork and critical thinking abilities of associates. Active role in grant applications. (Advisor: Prof. Sriram Vishwanath (ECE). Co-advisor: Prof. Ila Fiete (Neuroscience).)

**Alcatel-Lucent Bell Labs**, Holmdel, NJ
*Research Engineer Intern* **Oct. 2010 – Jan. 2011**
Member of Wireless Communication Theory Research Group.

Joint project with Nile University on relaying technologies in wireless mobile networks (published technical reports and 1 conference paper). Supervised 2 graduate associates at Nile University. Full time industry experience. (Advisor: Dr. Antonia Tulino.)

**The Ohio State University**, Columbus, OH
*Presidential Fellow* **Jan. 2010 – Dec. 2010**
*Research and Teaching Associate* **Sep. 2006 – Dec. 2009**

*University Fellow* **Sep. 2005 – Aug. 2006**
Member of Information Processing Systems Lab.

Research in the areas of information theory and wireless communications, focusing on cognitive radios, information theoretic security, and wireless networks (7 journal papers and 13 conference papers). Supervised 2 junior graduate associates during final year. Taught communications (instructor for 2 semesters with full responsibility) and digital signal processing (TA for 1 semester) courses. Thesis: "Wireless physical layer security: an information theoretic approach". (Advisor: Prof. Hesham El Gamal.)

**Bilkent University**, Ankara, Turkey
*Undergraduate Student* **Sep. 2001 – May 2005**
High Honor Student with Full Scholarship.

Senior project on "Implementation of Turbo codes": Developed a simulator program in MATLAB, designed various types of interleavers using Verilog and investigated their performances. Taught programming language course (TA for 1 semester) for incoming freshmen. 13 course projects (6 of them are group projects). (Advisor: Prof. Erdal Arikan.)

**AYESAS**, Ankara, Turkey
*Intern Engineer* **Jun. 2004 – Aug. 2004**
Member of Software Engineering Group.

Worked as a member of the team for SmartDeck IV&V project of L-3 Avionics Systems. Investigated IEEE 1394 standard, GPS theory, safety critical systems. Developed GPS test tool in MATLAB for verification and test case generation. Full time experience for 3 months in a startup-like environment at METU Incubator, teamed up with 25 intern peers and two managers. (AYESAS operates in Aerospace, Defense and Security businesses. [ayesas.com])

**ASELSAN**, Ankara, Turkey
*Intern Engineer* **Jul. 2003 – Aug. 2003**
Member of Micro-Electronics, Guidance, and Electro-Optics Group.

Worked in navigation systems team. Proposed analysis with C programming language. Interfaced GPS receiver and LCD using C. Analyzed the GPS system. ("ASELSAN is one of the top 100 defense companies in the world." [aselsan.com])

## Honors and Awards

*Cosyne Travel Grant Award* by the Cosyne 2012 Grant Committee **2012**

Awarded to "early career scientists with highly scored abstracts" for the work titled "Information theoretic limits on performance in short-term memory tasks". Sponsored by the Gatsby Charitable Foundation.

*Presidential Fellowship Award* by the Graduate School of The Ohio State University **2010**

Awarded to ∼20 students each semester after a university-wide selection, includes tuition waiver and stipend for a year. "The Presidential Fellowship is the most prestigious award given by the Graduate School."

*University Fellowship Award* by the Graduate School of The Ohio State University **2005**

Awarded to top incoming students, includes tuition waiver and stipend for a year.

*Bilkent University High Honor Student* **2001 – 2005**

Awarded to high GPA students, received it for all semesters.

*Full Undergraduate Scholarship* by Bilkent University **2001**

Awarded to top incoming students, includes tuition waiver, stipend, and housing for four years.

*Study Abroad Scholarship* by the Turkish Governmental Education Office **2001**

Awarded to top 200 students in the national university entrance exam of Turkey, includes undergraduate education coverage in overseas.

*Ranked 179th in the National University Entrance Exam of Turkey* **2001**

National university entrance exam is taken by ∼1.5 million students.

## Publications

### Reports and Preprints

[R-14] G. Calis, S. Shivaramaiah, O. O. Koyluoglu, and L. Lazos, "Repair Strategies for Storage on Mobile Clouds," submitted for publication, Feb. 2017.

[R-13] G. Calis, S. and O. O. Koyluoglu, "Architecture-aware coding for distributed storage: Repairable block failure resilient codes," submitted for publication, Feb. 2017.

[R-12] G. Calis and O. O. Koyluoglu, "Locally repairable block failure resilient codes," submitted for publication, Jan. 2017.

[R-11] I. Samy, G. Calis, and O. O. Koyluoglu, "Secure regenerating codes for hybrid cloud storage systems," submitted for publication, Jan. 2017.

[R-10] Y. Chen, O. O. Koyluoglu, and A. J. Han Vinck, "Joint secrecy over the K-transmitter multiple access channel," submitted for publication, Jan. 2017.

[R-9] B. Akgun, M. Krunz, and O. O. Koyluoglu, "Pilot contamination attacks in massive MIMO systems," submitted for publication, Jan. 2017.

[R-8] D. Schwartz and O. O. Koyluoglu, "On the organization of grid and place cells: Neural denoising via subspace learning," submitted for publication, Nov. 2016.

[R-7] H. Si, O. O. Koyluoglu, K. Appaiah, and S. Vishwanath, "Expansion coding for channel and source coding," submitted for publication, Nov. 2016.

[R-6] O. O. Koyluoglu, Y. Pertzov, S. Manohar, M. Husain, and I. R. Fiete, "Fundamental bound on the persistence and capacity of short-term memory stored as graded persistent activity," submitted for publication, Oct. 2016.

[R-5] G. Calis and O. O. Koyluoglu, "A general construction of PMDS codes," submitted for publication, May. 2016.

[R-4] B. Akgun, O. O. Koyluoglu, and M. Krunz, "Exploiting full-duplex receivers for achieving secret communications in multiuser MISO networks," submitted for publication, Apr. 2016.

[R-3] A. S. Rawat, O. O. Koyluoglu, and S. Vishwanath, "Centralized repair of multiple node failures with applications to communication efficient secret sharing," submitted for publication, Mar. 2016.

[R-2] Y. Chen, O. O. Koyluoglu, and A. Sezgin, "Individual secrecy for broadcast channels," submitted for publication, Dec. 2015.

[R-1] Y. Chen, O. O. Koyluoglu, and A. Sezgin, "Individual secrecy for broadcast channels with receiver side information," submitted for publication, Feb. 2015.

Journal Papers

[J-13] O. O. Koyluoglu, R. Soundararajan, and S. Vishwanath, "State amplification subject to masking constraints," *IEEE Transactions on Information Theory*, vol. 62, no. 11, pp. 6233-6250, Nov. 2016.

[J-12] H. Si, O. O. Koyluoglu, and S. Vishwanath, "Hierarchical polar coding for achieving secrecy over state-dependent wiretap channels without any instantaneous CSI," *IEEE Transactions on Communications*, vol. 65, no. 9, pp. 3609-3623, Sep. 2016.

[J-11] Y. Yoo, O. O. Koyluoglu, S. Vishwanath, and I. R. Fiete, "Multi-periodic neural coding for adaptive information transfer," *Theoretical Computer Science*, vol. 633, pp. 37-53, Jun. 2016.

[J-10] O. O. Koyluoglu, A. S. Rawat, and S. Vishwanath, "Secure cooperative regenerating codes for distributed storage systems," *IEEE Transactions on Information Theory*, vol. 60, no. 9, pp. 5228-5244, Sep. 2014.

[J-9] H. Si, O. O. Koyluoglu, and S. Vishwanath, "Polar Coding for Fading Channels: Binary and Exponential Channel Cases," *IEEE Transactions on Communications*, vol. 62, no. 8, pp. 2638-2650, Aug. 2014.

[J-8] A. S. Rawat, O. O. Koyluoglu, N. Silberstein, and S. Vishwanath, "Optimal locally repairable and secure codes for distributed storage systems," *IEEE Transactions on Information Theory*, vol. 60, no. 1, pp. 212-236, Jan. 2014.

[J-7] A. El Gamal, O. O. Koyluoglu, M. Youssef, and H. El Gamal, "Achievable secrecy rate regions for the two-way wiretap channel," *IEEE Transactions on Information Theory*, vol. 59, no. 12, pp. 8099-8114, Dec. 2013.

[J-6] K. Khalil, O. O. Koyluoglu, H. El Gamal, and M. Youssef, "Opportunistic secrecy with a strict delay constraint," *IEEE Transactions on Communications*, vol. 61, no. 11, pp. 4700-4709, Nov. 2013.

[J-5] O. O. Koyluoglu and H. El Gamal, "Polar coding for secure transmission and key agreement," *IEEE Transactions on Information Forensics and Security*, vol. 7, no. 5, pp. 1472-1483, Oct. 2012.

[J-4] O. O. Koyluoglu, C. E. Koksal, and H. El Gamal, "On the secrecy capacity scaling in wireless networks," *IEEE Transactions on Information Theory*, vol. 58, no. 5, pp. 3000-3015, May 2012.

[J-3] O. O. Koyluoglu and H. El Gamal, "Cooperative encoding for secrecy in interference channels," *IEEE Transactions on Information Theory*, vol. 57, no. 9, pp. 5682-5694, Sep. 2011.

[J-2] O. O. Koyluoglu, H. El Gamal, L. Lai, and H. V. Poor, "Interference alignment for secrecy," *IEEE Transactions on Information Theory*, vol. 57, no. 6, pp. 3323-3332, Jun. 2011.

[J-1] O. O. Koyluoglu and H. El Gamal, "On power control and frequency reuse in the two user cognitive channel," *IEEE Transactions on Wireless Communications*, vol. 8, no. 7, pp. 3546-3553, Jul. 2009.

Conference Papers

[C-46] D. Schwartz and O. O. Koyluoglu, "Neural noise improves path representation in a simulated network of grid, place, and time cells," in Proc. *2017 Computational and Systems Neuroscience (Cosyne 2017)*, Salt Lake City, UT, Feb. 2017.

[C-45] S. Shivaramaiah, G. Calis, O. O. Koyluoglu, and L. Lazos, "Threshold-based file maintenance strategies for mobile cloud storage systems," in Proc. *IEEE 2016 Global Communications Conference (Globecom 2016)*, Washington, DC, Dec. 2016.

[C-44] M. Ragone, S. Gianelli, D. Schwartz, L. Su, O. O.Koyluoglu, J. M. Fellous, "The role of hippocampal replay in a computational model of path learning," in Proc. *Neuroscience 2016*, San Diego, CA, Nov. 2016.

[C-43] D. Schwartz and O. O. Koyluoglu, "A hybrid code from grid and place cells," in Proc. *Neuroscience 2016*, San Diego, CA, Nov. 2016.

[C-42] Y. Chen, O. O. Koyluoglu, and A. Sezgin, "Individual secrecy for the broadcast channel," in Proc. *2016 International Symposium on Information Theory and Its Applications (ISITA 2016)*, Monterey, CA, Oct. 2016.

[C-41] Y. Chen, O. O. Koyluoglu, and A. J. Han Vinck, "On secure communication over the multiple access channel," in Proc. *2016 International Symposium on Information Theory and Its Applications (ISITA 2016)*, Monterey, CA, Oct. 2016.

[C-40] G. Calis and O. O. Koyluoglu, "On the maintenance of distributed storage systems with backup node for repair," in Proc. *2016 International Symposium on Information Theory and Its Applications (ISITA 2016)*, Monterey, CA, Oct. 2016.

[C-39] A. S. Rawat, O. O. Koyluoglu, and S. Vishwanath, "Centralized repair of multiple node failures," in Proc. *2016 IEEE International Symposium on Information Theory (ISIT 2016)*, Barcelona, Spain, Jul. 2016.

[C-38] A. S. Rawat, O. O. Koyluoglu, and S. Vishwanath, "Progress on high-rate MSR codes: Enabling arbitrary number of helper nodes," in Proc. *2016 Information Theory and Applications Workshop (ITA 2016)*, La Jolla, CA, Feb. 2016. (Invited.)

[C-37] B. Akgun, O. O. Koyluoglu, and M. Krunz, "Receiver-based friendly jamming with single-antenna full-duplex receivers in a multiuser broadcast channel," in Proc. *2015 IEEE Global Communications Conference (Globecom 2015)*, San Diego, CA, Dec. 2015.

[C-36] Y. Chen, O. O. Koyluoglu, and A. Sezgin, "On the individual secrecy rate region for the broadcast channel with an external eavesdropper," in Proc. *2015 IEEE International Symposium on Information Theory (ISIT 2015)*, Hong Kong, China, Jun. 2015.

[C-35] H. Si, O. O. Koyluoglu, and S. Vishwanath, "Achieving secrecy without any instantaneous CSI: Polar coding for fading wiretap channels," in Proc. *2015 IEEE International Symposium on Information Theory (ISIT 2015)*, Hong Kong, China, Jun. 2015.

[C-34] Y. Chen, O. O. Koyluoglu, and A. Sezgin, "On the individual secrecy for Gaussian broadcast channels with receiver side information," Proc. *2015 IEEE International Conference on Communications (ICC 2015)*, London, UK, Jun. 2015.

[C-33] I. Aykin, O. O. Koyluoglu, and J.-M. Fellous, "Formation of dorso-ventral grid cell modules: The role of learning," *2015 Computational and Systems Neuroscience (Cosyne 2015)*, Salt Lake City, UT, Mar. 2015.

[C-32] G. Calis and O. O. Koyluoglu, "Repairable block failure resilient codes," in Proc. *2014 IEEE International Symposium on Information Theory (ISIT 2014)*, Honolulu, HI, Jun. 2014.

[C-31] Y. Chen, O. O. Koyluoglu, and A. Sezgin, "On achievable individual-secrecy rate region for broadcast channels with receiver side information," in Proc. *2014 IEEE International Symposium on Information Theory (ISIT 2014)*, Honolulu, HI, Jun. 2014.

[C-30] H. Si, O. O. Koyluoglu, and S. Vishwanath, "Lossy compression of exponential and laplacian sources using expansion coding," in Proc. *2014 IEEE International Symposium on Information Theory (ISIT 2014)*, Honolulu, HI, Jun. 2014.

[C-29] A. S. Rawat, N. Silberstein, O. O. Koyluoglu, and S. Vishwanath, "Secure distributed storage systems: Local repair with minimum bandwidth regeneration," in Proc. *International Symposium on Communications, Control, and Signal Processing: Special Session on Security in Distributed and Cloud Storage Systems (ISCCSP'14 - SS1)*, Athens, Greece, Apr. 2014.

[C-28] O. O. Koyluoglu, Y. Chen, and A. Sezgin, "Broadcast channel with receiver side information: Achieving individual secrecy," in Proc. *2014 International Zurich Seminar on Communications (IZS 2014)* , Zurich, Switzerland, Feb. 2014.

[C-27] H. Si, O. O. Koyluoglu, and S. Vishwanath, "Polar coding for fading channels," in Proc. *2013 IEEE Information Theory Workshop (ITW 2013)*, Seville, Spain, Sep. 2013.

[C-26] G. Kamath, N. Silberstein, N. Prakash, A. S. Rawat, V. Lalitha, O. O. Koyluoglu, P. V. Kumar, and S. Vishwanath, "Explicit MBR all-symbol locality codes," in Proc. *2013 IEEE International Symposium on Information Theory (ISIT 2013)*, Istanbul, Turkey, Jul. 2013.

[C-25] A. S. Rawat, O. O. Koyluoglu, N. Silberstein, and S. Vishwanath, "Secure locally repairable codes for distributed storage systems," in Proc. *2013 IEEE International Symposium on Information Theory (ISIT 2013)*, Istanbul, Turkey, Jul. 2013.

[C-24] O. O. Koyluoglu, A. S. Rawat, and S. Vishwanath, "The secrecy capacity of minimum bandwidth cooperative regenerating codes," in Proc. *2013 IEEE International Symposium on Information Theory (ISIT 2013)*, Istanbul, Turkey, Jul. 2013.

[C-23] N. Silberstein, A. S. Rawat, O. O. Koyluoglu, and S. Vishwanath, "Optimal locally repairable codes via rank-metric codes," in Proc. *2013 IEEE International Symposium on Information Theory (ISIT 2013)*, Istanbul, Turkey, Jul. 2013.

[C-22] O. O. Koyluoglu and I. R. Fiete, "Information-theoretic limits on encoding over diverse populations," *2013 Computational and Systems Neuroscience (Cosyne 2013)*, Salt Lake City, UT, Feb. 2013.

[C-21] A. S. Rawat, N. Silberstein, O. O. Koyluoglu, and S. Vishwanath, "Optimal locally repaiarable codes with local minimum storage regeneration via rank-metric codes," in Proc. *2013 Information Theory and Applications Workshop (ITA 2013)*, San Diego, CA, Feb. 2013. (Invited.)

[C-20] Y. Yoo, O. O. Koyluoglu, S. Vishwanath, and I. Fiete, "Dynamic shift-map coding with side information at the decoder," in Proc. *Fiftieth Annual Allerton Conference on Communication, Control, and Computing (Allerton 2012)*, Monticello, IL, Oct. 2012.

[C-19] O. O. Koyluoglu, K. Appaiah, H. Si, and S. Vishwanath, "Expansion coding: Achieving the capacity of an AEN channel," in Proc. *2012 IEEE International Symposium on Information Theory (ISIT 2012)*, Boston, MA, Jul. 2012.

[C-18] M. Fadel, A. Hindy, A. El-Keyi, M. Nafie, O. O. Koyluoglu, and A. M. Tulino, "Resource allocation for throughput enhancement in cellular shared relay networks," in Proc. *35th IEEE Sarnoff Symposium (Sarnoff 2012)*, Newark, NJ, May 2012.

[C-17] O. O. Koyluoglu and I. R. Fiete, "Information theoretic limits on performance in short-term memory tasks, *2012 Computational and Systems Neuroscience (Cosyne 2012)*, Salt Lake City, UT, Feb. 2012. (travel grant award)

[C-16] S. Vishwanath, O. O. Koyluoglu, H. Si, K. Appaiah, "Coding over binary expansions," in Proc. *2012 Information Theory and Applications Workshop (ITA 2012)*, San Diego, CA, Feb. 2012. (Invited.)

[C-15] O. O. Koyluoglu, R. Soundararajan, and S. Vishwanath, "State amplification under masking

constraints," in Proc. *Forty-Ninth Annual Allerton Conference on Communication, Control, and Computing (Allerton 2011)*, Monticello, IL, Sep. 2011.

[C-14] K. Appaiah, O. O. Koyluoglu, and S. Vishwanath, "Polar alignment for interference networks," in Proc. *Forty-Ninth Annual Allerton Conference on Communication, Control, and Computing (Allerton 2011)*, Monticello, IL, Sep. 2011. (Invited.)

[C-13] M. Shahmohammadi, O. O. Koyluoglu, T. Khattab, and H. El Gamal, "On the degrees of freedom of the cognitive broadcast channel," in Proc. *2011 IEEE International Symposium on Information Theory (ISIT 2011)*, Saint Petersburg, Russia, Jul. 2011.

[C-12] O. Gungor, O. O. Koyluoglu, H. El Gamal, and C. Emre Koksal, "Proactive source coding," in Proc. 2011 *IEEE International Symposium on Information Theory (ISIT 2011)*, Saint Petersburg, Russia, Jul. 2011.

[C-11] M. Shahmohammadi, O. O. Koyluoglu, T. Khattab, and H. El Gamal, "Joint interference cancellation and dirty paper coding for cognitive cellular networks," in Proc. *2011 IEEE Wireless Communications and Networking Conference (WCNC 2011)*, Cancun, Mexico, Mar. 2011.

[C-10] O. O. Koyluoglu and H. El Gamal, "Polar coding for secure transmission and key agreement," in Proc. *2010 IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC 2010), Special Session on Physical Layer Security*, Istanbul, Turkey, Sep. 2010. (Invited.)

[C-9] E. Toher, O. O. Koyluoglu, and H. El Gamal, "Secrecy games over the cognitive channel," in Proc. *2010 IEEE International Symposium on Information Theory (ISIT 2010)*, Austin, TX, Jun. 2010.

[C-8] O. O. Koyluoglu, C. E. Koksal, and H. El Gamal, "On the effect of colluding eavesdroppers on secrecy capacity scaling," in Proc. *European Wireless 2010 (EW 2010), Invited Session on Physical Layer Security*, Lucca, Italy, Apr. 2010. (Invited.)

[C-7] O. O. Koyluoglu, C. E. Koksal, and H. El Gamal, "On the secrecy capacity scaling in wireless networks," in Proc. *2010 Information Theory and Applications Workshop (ITA 2010)*, UCSD, La Jolla, CA, Feb. 2010. (Invited.)

[C-6] A. El Gamal, O. O. Koyluoglu, M. Youssef, and H. El Gamal, "New achievable secrecy rate regions for the two way wiretap channel," in Proc. *2010 IEEE Information Theory Workshop (ITW 2010)*, Cairo, Egypt, Jan. 2010.

[C-5] K. Khalil, M. Youssef, O. O. Koyluoglu, and H. El Gamal, "On the delay limited secrecy capacity of fading channels," in Proc. *2009 IEEE International Symposium on Information Theory (ISIT 2009)*, Seoul, Korea, Jun. 2009.

[C-4] O. O. Koyluoglu, M. Shahmohammadi, and H. El Gamal, "A new achievable rate region for the X channel," in Proc. *2009 IEEE International Symposium on Information Theory (ISIT 2009)*, Seoul, Korea, Jun. 2009.

[C-3] O. O. Koyluoglu and H. El Gamal, "On the secrecy rate region for the interference channel," in Proc. *2008 IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC 2008), Special Session on Physical Layer Security*, Cannes, France, Sep. 2008. (Invited.)

[C-2] O. O. Koyluoglu, H. El Gamal, L. Lai, and H. V. Poor, "On the secure degrees of freedom in the K-user Gaussian interference channel," in Proc. *2008 IEEE International Symposium on Information Theory (ISIT 2008)*, Toronto, ON, Jul. 2008.

[C-1] O. O. Koyluoglu and H. El Gamal, "On the utility of frequency reuse in cognitive radio channels," in Proc. *IEEE International Symposium on Information Theory (ISIT 2007)*, Nice, France, Jun. 2007.

Thesis

[T-1] O. O. Koyluoglu, "Wireless physical layer security: An information theoretic approach," *PhD dissertation*, The Ohio State University, Dec. 2010.

## Awarded Grants

- *PI*, NSF TWC: Small: Coding-based Mechanisms for Building Secure Cloud Storage Systems (Grant number: CNS-1617335, Award amount: $360,000, Award period: 08/01/16 - 07/31/19, Percent effort: 100%.)
- *PI*, NSF CIF: Medium: Collaborative Research: Frontiers in coding for cloud storage systems (Grant number: CCF-1563622, Award amount: $400,000, Award period: 03/01/16 - 02/28/19, Percent effort: 100%.) This is a collaborative project with PIs Venkatesan Guruswami (CMU) and Sriram Vishwanath (UT Austin).
- *PI*, NSF CRII: RI: Navigational Circuitry of Brain: Novel Neural Codes with Diversity for Robust and Adaptive Location Processing (Grant number: IIS-1464349, Award amount: $115,247, Award period: 04/2015 - 03/2017, Percent effort: 100%).

## Teaching Experience

**The University of Arizona**, Tucson, AZ

- ECE 639 Detection and Estimation (Spring 2014, Spring 2016): Lecture slides are prepared and videos are recorded for online offering. (Course offered online during both semesters.)
- APPL 595B Theoretical Neuroscience Journal Club (Spring 2015, Fall 2015, Spring 2016, Fall 2016): Co-offered with J.-M. Fellous (Psychology), K. Lin (Applied Math), C. Zhang (Applied Math). This interdisciplinary course is based on introductory seminars of the instructors followed by discussion of seminal works and recent research papers in the area.
- ECE/MATH 636 Information Theory (Fall 2013, Fall 2015): Lecture notes and course materials are prepared. Slides and videos are prepared for the online offering. (Course offered online during Fall 2015.)
- ECE 340A Introduction to Communications (Spring 2015): Prepared lecture slides and course materials.
- ECE 637 Coding Theory (Fall 2014): Prepared lecture slides and course materials.

**The University of Texas at Austin**, Austin, TX

- EE 381K Information Theory (Spring 2012): Instructed data compression and coding (2 lectures), the channel coding theorem (1 lecture), network information theory (4 lectures)

**The Ohio State University**, Columbus, OH

- ECE 702 Digital Communications (Spring 2009): Held problem solving sessions
- ECE 609 DSP Lab (Spring 2007): Instructed lab sessions (involving designs on filter implementations, FFT, and adaptive filtering for system identification and interference cancellation), received travel grant to visit UIUC, redesigned the course with TI-55x boards, prepared new assignments and lab manuals
- ECE 508 Communication Lab (Winter 2007, Winter 2008): Instructed lab sessions with full responsibility, prepared lecture notes, quizzes, exams, and held both theory and lab sessions

**Bilkent University**, Ankara, Turkey

- CS 101 Algorithms and Programming (Fall 2003): Instructed lab sessions for a group of 30 students

## Research Supervising and Mentoring

**The University of Arizona**, Tucson, AZ

Dissertations directed and in progress

- Islam Samy (Fall 2016 – present): Research on cloud storage security. (PhD student.)
- Berk Akgun (Fall 2014 – present): Research on wireless networking and security. Co-advised with Prof. Marwan Krunz. (PhD student, published 1 conference paper, submitted 1 journal and 1 conference papers.)
- Gokhan Calis (Fall 2013 – present): Research on coding theory and distributed storage systems. (PhD student, published 3 conference papers, submitted 3 journal papers.)

Theses directed and in progress

- Jiashu Guo (Fall 2016 – present): Research on machine learning and computational neuroscience. (MS student.)
- Zhengzhong Liang (Fall 2016 – present): Research on machine learning and computational neuroscience. (MS student.)
- David Schwarz (Fall 2015 – present): Research on computational neuroscience. (MS student, published 2 conference papers.)

Independent studies directed and in progress

- Shuai Yuan (Summer 2014 – Fall 2014): Research on navigational mechanisms of brain. (MS student, summer volunteer and independent study, finished a project with UG students.)

Collaborations with undergraduate and graduate students on research projects

- Michael Ragone (Spring 2016 – Fall 2016): Research on computational neuroscience, hippocampal replay and path learning. (UG student, published 1 conference paper.)
- Sam Jared Gianelli (Spring 2016 – Fall 2016): Research on computational neuroscience, hippocampal replay and path learning. (UG student, published 1 conference paper.)
- Irmak Aykin (Fall 2014 – Summer 2015): Research on computational neuroscience. (PhD student, member of the lab for two semesters, published 1 conference paper.)
- Atta Kashmiri (Summer 2014): Research on computational neuroscience. (UG student, gained research experience.)
- Nikitha Ramohalli (Summer 2014): Research on computational neuroscience. (UG student, gained research experience, received NASA Fellowship Award in September 2014.)

**The University of Texas at Austin**, Austin, TX

- Hongbo Si (Spring 2011–Spring 2015): Research on expansion coding and polar codes. Supervised jointly with Prof. Sriram Vishwanath. (Published 2 journal papers, and 3 conference papers.)
- Yongseok Yoo (Spring 2012–Spring 2013): Research on shift-map codes. Supervised jointly with Prof. Ila R. Fiete and Prof. Sriram Vishwanath. (Published 1 journal paper and 1 conference paper.)
- Ankit Singh Rawat (Spring 2012–Spring 2013): Research on coding for distributed storage systems (supervised with Dr. Natalia Silberstein). Worked on the project with Huawei Dallas R&D on coding for memory systems. Supervised jointly with Prof. Sriram Vishwanath. (Published 2 journal papers, and 6 conference papers.)
- Muryong Kim (Fall 2012): Research on shaping of codes for AWGN channels (LDPC) for the project with Samsung Korea. Supervised jointly with Prof. Sriram Vishwanath.

- Kumar Appaiah (Summer 2011–Fall 2011): Research on polar coding for networks and expansion coding. Supervised jointly with Prof. Sriram Vishwanath. (Published 3 conference papers.)
- Rajiv Soundararajan (Summer 2011–Fall 2011): Research on information theoretic security. Supervised jointly with Prof. Sriram Vishwanath. (Published 1 journal paper, and published 1 conference paper.)
- Fabio Fernandez (Spring 2011): Research on polar coding for networks. Supervised jointly with Prof. Sriram Vishwanath.
- Cong Li (Spring 2011-Summer 2011): Research on private queuing mechanisms and smart grid privacy. Supervised jointly with Prof. Sriram Vishwanath.

**Alcatel-Lucent Bell Labs**, Holmdel, NJ

- Mohamed Fadel (Fall 2010–Spring 2011): Research on cellular shared relay networks. Mr. Fadel was with Nile University, Egypt. Supervised jointly with Prof. Hesham El Gamal and Prof. Mohammed Nafie. (Publised 1 conference paper.)
- Ahmed Hindy (Fall 2010–Spring 2011): Research on cellular shared relay networks. Mr. Hindy was with Nile University, Egypt. Supervised jointly with Prof. Hesham El Gamal and Prof. Mohammed Nafie. (Publised 1 conference paper.)

**The Ohio State University**, Columbus, OH

- Elizabeth Toher (Fall 2009): Research on cognitive network security. Mr. Toher was a M.Sc. student at Ohio State. Supervised jointly with Prof. Hesham El Gamal. (Publised 1 conference paper.)
- Karim Khalil (Fall 2008–Spring 2009): Research on secure networks with delay constraints. Mr. Khalil was with Nile University, Egypt. Supervised jointly with Prof. Hesham El Gamal. (Published 1 journal paper, and 1 conference paper.)

## Professional Service and Memberships

### Departmental Committees

*Computing Policy Committee Member*, Department of Electrical and Computer Engineering, University of Arizona. **2013 – 2015, 2016 – 2017**

*Executive Committee Member*, Department of Electrical and Computer Engineering, University of Arizona. **2014 – 2016**

*Committee on Committees Member*, Department of Electrical and Computer Engineering, University of Arizona. **2014 – 2016**

*Graduate Recruiting and Awards Committee Member*, Department of Electrical and Computer Engineering, University of Arizona. **2014 – 2015**

*Dissertation and Graduate Exam Committee Memberships* [1]

- PhD Defenses (6): Tao Liu (Spring 2016), ChangYu Lin (Spring 2016), Yan Zhang (Spring 2015), Hongbo Si (Spring 2015, UT Austin), Vida Ravanmehr (Spring 2015), Mohammad J. Abdel-Rahman (Fall 2014).
- MS Defenses (2): Swetha Shivaramaiah (Spring 2015), Jin Bai (Spring 2015)

[1] Non-advisor activities.

- PhD Written Comprehensive Exam (10): Nirnimesh Ghose (Spring 2016), Tzyy-Juin Kao (Spring 2016), Wessam Afifi (Fall 2015), Tao Liu (Fall 2015), Nirnimesh Ghose (Spring 2015), ChangYu Lin (Spring 2015), Seyed Mehrdad Khatami (Fall 2014), Qi Tang (Spring 2014), Mohammad J. Abdel-Rahman (Fall 2013), Hongbo Si (Fall 2013, UT Austin).
- PhD Oral Comprehensive Exam (5): Ture Peken (Spring 2016), ChangYu Lin (Fall 2015), Vida Ravanmehr (Spring 2015), Qi Tang (Spring 2014), Alejandro Adrian Proano Lozada (Fall 2013).

Local/State Outreach

*SARSEF grant judge* for Middle School projects **Spring 2014, 2015, 2016**

Around 75,000 students participate to the fair each year. Winners get awards at the end of the fair and advance to the higher level competitions, including the International Science and Engineering Fair (ISEF). Participated with graduate associates in the lab.

Service for Professional Organizations

*Editor* for

- IEEE Transactions on Wireless Communications **May 2015 – present**

*Co-Chair* for

- 2017 IEEE International Conference on Communications, Selected Areas in Communications Symposium (Data Storage Track)

*Organizing Committee Member* for

- 2010 IEEE Information Theory Workshop (Publicity Committee)

*Technical Program Committee Member* for

- 2018 IEEE International Conference on Computer Communications (INFOCOM)
- 2017 IEEE International Conference Communications, Communication and Information Systems Security Symposium (ICC'17 CISS)
- 2017 IEEE International Conference on Computer Communications (INFOCOM)
- 2016 ICC Workshop on Wireless Physical Layer Security
- 2015 CNS Workshop on Physical-layer Methods for Wireless Security
- 2015 IEEE International Symposium on Information Theory (ISIT)

*Reviewer* for IEEE Transactions on Information Theory, IEEE Transactions on Wireless Communications, IEEE Transactions on Information Forensics and Security, IEEE/ACM Transactions on Networking, IEEE Transactions on Vehicular Technology, IEEE Transactions on Communications, IEEE Journal on Selected Areas in Communications, EURASIP Journal on Wireless Communications and Networking, IEEE Communications Letters, IEEE Signal Processing Letters, Ad Hoc Networks, PLOS Computational Biology, Journal of Computer Security, Army Research Office, Israel Science Foundation, and several conferences including IEEE ISIT, IEEE Globecom, IEEE ICC, IEEE VTC, IEEE PIMRC, MILCOM, IEEE INFOCOM, European Wireless, IEEE ITW, IEEE Dyspan, ISITA, IWCIT, ISTC.

*Panelist* at NSF (2015, 2016, 2017) for CCF, CNS, and IIS programs.

*Senior Member* of IEEE (Student Member 2002-2010, Member 2011-2017).

*Member* of IEEE Information Theory Society, IEEE Communications Society, Society for

Neuroscience.

## List of Collaborators

List of collaborators on grants and publications from last five years

- Ali Akoglu; University of Arizona
- Kumar Appaiah; Qualcomm
- Tamal Bose; University of Arizona
- Yanling Chen; Ruhr-Universitat Bochum
- Jean-Marc Fellous; University of Arizona
- Ila R. Fiete; UT Austin
- Hesham El Gamal; OSU
- Venkatesan Guruswami; CMU
- Salim Hariri; University of Arizona
- Masud Husain; Oxford
- Amr El-Keyi; Nile U.
- Tamer Khattab; Qatar University
- Can Emre Koksal; OSU
- Marwan Krunz; University of Arizona
- P. Vijay Kumar; IISc
- Lifeng Lai; WPI
- Loukas Lazos; University of Arizona
- Hong Lei; University of Arizona
- Sanjay Monohar; Oxford
- Mohammed Nafie; Nile U.
- Yoni Pertzov; Hebrew U.
- H. Vincent Poor; Princeton
- Aydin Sezgin; Ruhr-Universitat Bochum
- Mohammed Shahmohammadi; ASSIA Inc.
- Natalia Silberstein; Technion
- Rajiv Soundararajan; Qualcomm
- Antonio M. Tulino; Alcatel-Lucent Bell Labs
- Bane Vasic; University of Arizona
- Sriram Vishwanath; UT Austin
- Moustafa Youssef; EJUST

Graduate, postdoctoral, thesis advisors or sponsors

- Ila R. Fiete; UT Austin
- Hesham El Gamal; OSU
- Sriram Vishwanath; UT Austin