Yunghsiang S. Han

Graduate Institute of Communication Engineering
National Taipei University
151. University Rd., Sanshia, Taipei County
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Education

SYRACUSE UNIVERSITY — Syracuse, NY

- Ph.D. in Computer and Information Science (August 1993)
  - *Dissertation Topic: Efficient Soft-Decision Decoding Algorithms for Linear Block Codes Using Algorithm A*.*
  - **Winner of Syracuse University Doctoral Prize of the Year 1994.**

NATIONAL TSING HUA UNIVERSITY — Hsinchu, Taiwan, R. O. C.

- MS in Electrical Engineering (June 1986)
- BS in Electrical Engineering (June 1984)

Professional Experience

GRADUATE INSTITUTE OF COMMUNICATION ENGINEERING
NATIONAL TAIPEI UNIVERSITY — Taiwan, R. O. C.
August 2004 – present
Professor and Chairperson.

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION ENGINEERING
NATIONAL CHI NAN UNIVERSITY — Taiwan, R. O. C.
August 1998 – July 2004
Professor.

THE NEW YORK STATE CENTER FOR ADVANCED TECHNOLOGY IN COMPUTER APPLICATIONS AND SOFTWARE ENGINEERING (CASE)
THE CENTER FOR SYSTEMS ASSURANCE (CSA)
DEPARTMENT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE
SYRACUSE UNIVERSITY — Syracuse NY, USA
September 2002 – January 2004
SUPRIA (Syracuse University Prototypical Research in Information Assurance)
Visiting Research Scholar.

DEPARTMENT OF ELECTRICAL ENGINEERING
UNIVERSITY OF HAWAII AT MANOA — Honolulu HI , USA
June 2001 – October 2001
Visiting Scholar.

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION ENGINEERING
NATIONAL CHI NAN UNIVERSITY — Taiwan, R. O. C.
August 1998 – July 2001
The Head of Computer and Network Center.

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION ENGINEERING
NATIONAL CHI NAN UNIVERSITY — Taiwan, R. O. C.

August 1997 – July 1998
Associate Professor.

Department of Electronic Engineering
Hua Fan College of Humanities and Technology — Taiwan, R. O. C.
September 1994 – July 1996
The Head of Computer Center.

Department of Electronic Engineering
Hua Fan College of Humanities and Technology — Taiwan, R. O. C.
August 1993 – July 1997
Associate Professor.

Department of Computer and Information Science
Syracuse University — Syracuse, NY
August 1992 – August 1993
Graduate Research Associate.

Department of Computer and Information Science
Syracuse University — Syracuse, NY
August 1989 – July 1992
Graduate Teaching Assistant.

Professional Services

Reviewer: *IEEE Trans. on Information Theory* and *IEEE Trans. on Communications*

Awards & Honors

- 2000-2004, *SUPRIA Visiting Research Scholarship* – Awarded by CASE center at Syracuse University, New York.
- 2000, *89-fiscal-year Research Award* – Awarded by National Science Council, Taiwan, ROC.
- 2000, *Research Award* – Awarded by National Chi Nan University, Taiwan, ROC.
- 1999, *88-fiscal-year Research Award* – Awarded by National Science Council, Taiwan, ROC.
- 1998, *87-fiscal-year Research Award* – Awarded by National Science Council, Taiwan, ROC.
- 1997, *86-fiscal-year Research Award* – Awarded by National Science Council, Taiwan, ROC.
- **1997**, A paper was honored as long presentation at *the 1997 IEEE International Symposium on Information theory.* [1]
- **1994**, *Syracuse University Doctoral Prize of the Year 1994* – Awarded by Syracuse University.
- 1994, *83-fiscal-year Research Award* – Awarded by National Science Council, Taiwan, ROC.
- 1993, *82-fiscal-year Research Award for Young Researcher* – Awarded by National Science Council, Taiwan, ROC.
- **1993**, A paper was honored as long presentation at *the 1993 IEEE International Symposium on Information theory.*

Professional Memberships

- Member of IEEE – Information Theory and Communication Societies.
- Member of SIAM.

[1] Only papers with the potential to have an impact on the state of the art of their respective research areas are accepted as long presentations. Usually there are only 17 of 580 accepted papers to be honored as long presentations.

Research Interests

- Wireless Networks– especially on the security, energy control, and analysis of sensor networks and ad hoc networks.
- Security– especially on the topics related to sensor networks and privacy-preserving.
- Coding Theory– especially on the development of the theory of decoding and the design of practical decoding algorithms for error-correcting codes.
- Wireless Communication– especially on the application of error-correcting codes.
- Interconnection Network– especially on the distance problem on an interconnection network.
- Algorithms– especially on the application of information theoretic concepts for design algorithms.

Publications

- Book Chapters
  1. Y. S. Han and P.-N. Chen, "Sequential Decoding of Convolutional Codes," *Encyclopedia of Telecommunications* (Editor: John Proakis), New York, Wiley, 2002.
- Refereed papers
  1. J. Deng, Y. S. Han, W. B. Heinzelman, and P. K. Varshney, "Balanced-energy Sleep Scheduling Scheme for High Density Cluster-based Sensor Networks," *Computer Communications : special issue on ASWN04*, to appear. **(full paper)**
  2. T.-Y. Wang, Y. S. Han, P. K. Varshney, and P.-N. Chen, "Distributed Fault-Tolerant Classification in Wireless Sensor Networks," *IEEE Journal on Selected Areas in Communications (JSAC): special issue on Self-Organizing Distributed Collaborative Sensor Networks*, to appear (April 2005). **(full paper)**
  3. W. Du, J. Deng, Y. S. Han, P. K. Varshney, J. Katz, and A. Khalili, "A Pairwise Key Pre-distribution Scheme for Wireless Sensor Networks," *ACM Trans. on Information and System Security (TISSEC)*, to appear. **(full paper)**
  4. C.-C. Lee, P.-C. Chung, D.-R. Duh, Y. S. Han, and C.-W. Lin, "A Practice of a Collaborative Multipoint Medical Teleconsultation System on Broadband Network," *Journal of High Speed Networks*, accepted. **(full paper)**
  5. J. Deng, Y. S. Han, W. B. Heinzelman, and P. K. Varshney, "Scheduling Sleeping Nodes in High Density Cluster-based Sensor Networks," *ACM/Kluwer MONET Special Issue on "Energy Constraints and Lifetime Performance in Wireless Sensor Networks,"* to appear (April 2005). **(full paper)**
  6. Y. S. Han, P.-N. Chen and H.-B. Wu, "A Maximum-Likelihood Soft-Decision Sequential Decoding Algorithm for Binary Convolutional Codes," *IEEE Trans. on Communications*, pp. 173-178, February, 2002.
  7. P.-N. Chen and Y. S. Han, "Asymptotic Minimum Covering Radius of Block Codes," *SIAM Journal on Discrete Mathematics*, pp. 549-564, November, 2001. **(full paper)**
  8. P.-N. Chen, T.-Y. Lee, and Y. S. Han, "Distance-Spectrum Formulas on the Largest Minimum Distance of Block Codes, " *IEEE Trans. on Information Theory*, pp. 869-885, May, 2000. **(full paper)**
  9. Y. S. Han, "A New Decoding Algorithm for Complete Decoding of Linear Block Codes," *SIAM Journal on Discrete Mathematics*, pp. 664-671, November, 1998. **(full paper)**
  10. Y. S. Han, "A New Treatment of Priority-First Search Maximum-Likelihood Soft-Decision Decoding of Linear Block Codes," *IEEE Trans. on Information Theory*, pp. 3091-3096, November, 1998.
  11. Y. S. Han, C. R. P. Hartmann, and K. G. Mehrotra, "Decoding Linear Block Codes Using a Priority-First Search: Performance Analysis and Suboptimal Version," *IEEE Trans. on Information Theory*, pp. 1233-1246, May, 1998.
  12. Y. S. Han, and C. R. P. Hartmann, "The Zero-Guards Algorithm for General Minimum Distance Decoding Problem," *IEEE Trans. on Information Theory*, pp. 1655-1658, September, 1997.

13. D. L. Tao, C. R. P. Hartmann , and Y. S. Han, "New Encoding/Decoding Methods for Designing Fault-Tolerant Matrix Operations, "*IEEE Trans. on Parallel and Distributed Systems*, pp. 931-938, September, 1996. **(full paper)**
14. Y. S. Han, C. R. P. Hartmann, and C-C. Chen, "Efficient Priority-First Search Maximum-Likelihood Soft-Decision Decoding of Linear Block Codes," *IEEE Trans. on Information Theory*, pp. 1514-1523, September, 1993. **(full paper)**

- Refereed Conference

1. 1. P.-N. Chen, T.-Y. Wang, Y. S. Han, P. K. Varshney and C. Yao, "Asymptotic Performance Analysis for minimum-Hamming-distance fusion", *the IEEE International Conference on Acoustics, Speech, and Signal Processing 2005 (ICASSP'05)*, Philadelphia, USA.
2. S.-L. Shieh, P.-N. Chen, and Y. S. Han,"A Novel Modification of Cyclic Redundancy Check for Message Length Detection," *the 2004 IEEE International Symposium on Information Theory and its Applications (ISITA2004)*, Parma, Italy, October, 2004.
3. C.-W. Chang, P.-N. Chen, and Y. S. Han, "Realization of a Systematic Bit-wise Decomposition Metric," *the 2004 IEEE Asia-Pacific Conference on Circuits and Systems (APCCAS'04)*, Tainan, Taiwan, December, 2004.
4. J. Deng, Y. S. Han, W. B. Heinzelman, and P. K. Varshney, "Balanced-energy Sleep Scheduling Scheme for High Density Cluster-based Sensor Networks," *4th Workshop on Applications and Services in Wireless Networks (ASWN04)*, Boston, Massachusetts, August, 2004. **(Selected for possible publication in a special issue of Elsevier's Computer Communications Journal)**
5. Y.-J. Chen, D.-R. Duh, and Y. S. Han, "A New Modulo (2^n+1) Multiplier for IDEA," *the 2004 International Conference on Security and Management (SAM'04)*, Las Vegas, Nevada, June, 2004, pp. 318-324.
6. T.-Y. Wang, Y. S. Han, and P. K. Varshney, "A Combined Decision Fusion and Channel Coding Scheme for Fault-Tolerant Classification in Wireless Sensor Networks," *the 2004 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2004)*, Montreal, Quebec, Canada, May, 2004, pp. 1073-1076.
7. J. Deng, Y. S. Han, P.-N. Chen, and P. K. Varshney, "Optimum Transmission Range for Wireless Ad Hoc Networks," *the IEEE Wireless Communications and Networking Conference 2004 (WCNC04)*, Atlanta, GA, March, 2004, pp. 1024-1029.
8. W. Du, Y. S. Han, and S. Chen "Privacy-Preserving Multivariate Statistical Analysis: Linear Regression and Classification," *the 2004 SIAM International Conference on Data Mining (SDM04)*, Lake Buena Vista, FL, April, 2004, pp. 222-233. (Regular paper)
9. T.-Y. Wang, Y. S. Han, and P. K. Varshney, "Further Results on Fault-Tolerant Distributed Classification Using Error Correcting Codes," *the SPIE's Aerosense conference on Multisensor, Multisource Information Fusion: Architectures, Algorithms, and Applications*, Orlando, FL, April, 2004.
10. W. Du, J. Deng, Y. S. Han, S. Chen and P. K. Varshney "A Key Management Scheme for Wireless Sensor Networks Using Deployment Knowledge," the *IEEE INFOCOM 2004*, Hong Kong, March 2004, pp.586-597.
11. W. Du, J. Deng, Y. S. Han, and P. K. Varshney, "A Pairwise Key Pre-distribution Scheme for Wireless Sensor Networks," *Proceedings of 10th ACM Conference on Computer and Communications Security (CCS2003)*, Washington DC, October, 2003, pp. 42-51.
12. J. Deng, Y. S. Han, and Z. J. Haas, "Analyzing Split Channel Medium Access Control Schemes with ALOHA Reservation," in *Ad-Hoc, Mobile, and Wireless Networks – ADHOC-NOW '03*, S. Pierre, M. Barbeau, and E. Kranakis, Eds. 2003, vol. 2865 of Lecture Notes in Computer Science (LNCS), pp. 128-139, Springer-Verlag.

13. W. Du, J. Deng, Y. S. Han, and P. K. Varshney, "A Witness-Based Approach for Data Fusion Assurance in Wireless Sensor Networks," *Proceedings of IEEE 2003 Global Communications Conference (Globecom2003)*, San Francisco, CA, December, 2003, pp. 1435-1439.
14. T.-Y. Wang, Y. S. Han, and P. K. Varshney, "Fault-Tolerant Classification in Multisensor Networks Using Coding Theory," *Proceedings of the 6th International Conference on Information Fusion (Fusion2003)*, Cairns, Australia, July, 2003, pp. 772-779. **(invited paper)**
15. T.-Y. Wang, P. K. Varshney, and Y. S. Han, "Distribution Classification Fusion Using Error Correcting Codes," *Proceedings of the SPIE's Aerosense conference on Multisensor, Multisource Information Fusion: Architectures, Algorithms, and Applications*, Orlando, FL, April, 2003, pp. 47-57.
16. Y. S. Han, P.-N. Chen, and M. Fossorier, "A Generalization of the Fano Metric and Its Effect on Sequential Decoding Using a Stack," *Proceedings of the IEEE International Symposium on Information Theory*, Lausanne, Switzerland, June, 2002, p. 134.
17. P.-N. Chen, Y. S. Han, C. R. P. Hartmann, and H.-B. Wu, "Analysis of Decoding Complexity Using New Variation of Berry-Esseen Theorem," *Proceedings of the IEEE International Symposium on Information Theory*, Lausanne, Switzerland, June, 2002, p. 286.
18. C.-K. Lin, P.-N. Chen and Y. S. Han, "A Low-Complexity Stochastic Codebook Searching Algorithm for FS1016," *Workshop on the 21st Century Digital Life and Internet Technologies*, Tainan, Taiwan, May, 2001.
19. Y. S. Han and P.-N. Chen, "Asymptotic Covering Radius of Block Codes ," *Proceedings of the International Symposium on Information theory and Its Applications*, Honolulu, Hawaii, November, 2000, pp. 521-524.
20. T.-Y. Lee, P.-N. Chen and Y. S. Han, "Determination of the Asymptotic Largest Minimum Distance of Block Codes," *Proceedings of the IEEE International Symposium on Information Theory*, Sorrento, Italy, June, 2000, p. 227.
21. H.-B. Wu, P.-N. Chen, and Y. S. Han,"Investigation of the Maximum-Likelihood Soft-Decision Sequential Decoding algorithms for convolutional Codes," *Proceedings of the International Symposium on Communications*, Kaohsiung, Taiwan, November, 1999, pp. 82-86.
22. Y. S. Han, "A Minimum ρ-Distance Decoding Algorithm of Linear Block Codes Based on Voronoi Neighbors, " *Proceedings of the International Symposium on Communications*, Hsinchu, Taiwan, December, 1997, pp. 99-103.
23. Y. S. Han, "An Optimal Gradient Decoding Algorithm for Hard-Decision Decoding of Linear Block Codes," *Proceedings of the International Conference on Combinatorics, Information Theory and Statistics*, Portland, Maine, July, 1997, p. 36. **(invited speaker)**
24. Y. S. Han, "A New Treatment of Priority-First Search Maximum-Likelihood Soft-Decision Decoding for Linear Block Codes," *Proceedings of the IEEE International Symposium on Information Theory*, Ulm, Germany, June, 1997, p. 394. **(honored as long presentation)**
25. Y. S. Han, "The Zero-Coverings Algorithm for General Minimum Distance Decoding Problem," *Proceedings of the IEEE International Symposium on Information Theory*, Ulm, Germany, June, 1997, p. 330.
26. Y. S. Han, "The Effect of Heuristic Information on the Soft-Decision Decoding for Linear Block Codes,"*Proceedings of the Seventh IEEE International Symposium on Personal, Indoor and Mobile Radio Communications*, Taipei, Taiwan, October, 1996. pp. 309-311.
27. Y. S. Han, C. R. P. Hartmann, C.-T. Chin, and C. K. Mohan, "Efficient Suboptimal Decoding of Linear Block Codes ," *Proceedings of the 32nd Allerton Conference on*

Communication, Control, and Computing, University of Illinois, Urbana-Champaign, September, 1994, pp. 93-102. **(invited paper)**

28. Y. S. Han, C. R. P. Hartmann, and K. G. Mehrotra, "Further Results on Decoding Linear Block Codes Using a Generalized Dijkstra's Algorithm," *Proceedings of the 1994 IEEE International Symposium on Information Theory*, Trondheim, Norway, June, 1994, p. 342.
29. Y. S. Han, C. R. P. Hartmann, and C-C. Chen, "Efficient Maximum-Likelihood Soft-Decision Decoding of Linear Block Codes Using Algorithm A*, " *Proceedings of the 1993 IEEE International Symposium on Information Theory*, San Antonio, Texas, January 1993, p. 27. **(honored as long presentation)**
30. D. L. Tao, Y. S. Han, and C. R. P. Hartmann, "New Encoding/Decoding Methods for Designing Fault-Tolerant Matrix Operations," *Proceedings of SPIE, Vol. 1770, Advanced Signal Processing, Algorithms, Architectures, and Implementations III*, pp. 72-83, July 1992.

- Technical reports

1. Y. S. Han, and C. R. P. Hartmann, "Designing Efficient Maximum-Likelihood Soft-Decision Decoding of Linear Block Codes Using Algorithm A*," Technical Report SU-CIS-92-10, School of Computer and Information Science, Syracuse University, Syracuse, NY, June 1992.
2. Y. S. Han, C. R. P. Hartmann, and C-C Chen, "Efficient Maximum-Likelihood Soft-Decision Decoding of Linear Block Codes Using Algorithm A*," Technical Report SU-CIS-91-42, School of Computer and Information Science, Syracuse University, Syracuse, NY, December 1991.