

# Yong-Yeol Ahn

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CONTACT INFORMATION	School of Informatics and Computing Indiana University Bloomington 919 E 10th street Bloomington, IN 47408	<i>Voice:</i> (812) 856-2920 <i>Fax:</i> (812) 855-0600 <i>E-mail:</i> <a href="mailto:yyahn@indiana.edu">yyahn@indiana.edu</a> <i>WWW:</i> <a href="http://yongyeol.com">http://yongyeol.com</a>
RESEARCH INTERESTS	Structure and dynamics of complex networks; modular organization of networks; biological networks including protein-protein interaction networks, genetic regulatory networks, metabolic networks, and brain networks; social media	
ACADEMIC POSITIONS	<b>Indiana University</b> , Bloomington, IN, USA Assistant Professor, School of Informatics and Computing <b>Northeastern University</b> , Boston, MA, USA Post-doctoral research associate <b>Dana-Farber Cancer Institute, Harvard University</b> , Boston, MA, USA Visiting Researcher <b>Jacobs University</b> , Bremen, Germany ICTS fellow Visiting Researcher <b>KAIST</b> , Daejeon, South Korea Postdoctoral Research Associate Research Assistant Teaching Assistant	Oct 2011 to present June 2008 to May 2011 June 2008 to May 2011 June 2008 to May 2011 March 2007 to April 2007 July 2006 to August 2006 February 2008 to May 2008 March 2003 to January 2008 March 2002 to February 2003
INDUSTRIAL POSITIONS	<b>Janys analytics</b> Co-founder	May 2011 to present
EDUCATION	Ph.D. Physics, KAIST (Daejeon, South Korea), February 2008 <ul style="list-style-type: none"><li>• Thesis topic: Organizing Principles and Dynamics of Complex Networks</li><li>• Advisor: Professor Hawoong Jeong</li></ul> M.S. Physics, KAIST (Daejeon, South Korea), February 2003 B.S. Physics, KAIST (Daejeon, South Korea), February 2001	
TEACHING	<b>Instructor</b> H400/I400/I590 Visual Analytics, IUB I590 Complex Networks and Their Applications, IUB <b>Teaching Assistant</b> Computational Physics, KAIST Classical Mechanics, KAIST General Physics II, KAIST General Physics I, KAIST	Spring 2012 Spring 2012 Fall 2003 Spring 2003 Fall 2002 Spring 2002
ADVISING	<b>High School Interns</b> Chloe Kilman-Silver (Winsor School) <b>Thesis Review</b>	Summer 2011

SELECTED HONORS  
& AWARDS**Honors**

- Outstanding Young Researcher Award, AKPA (Association of Korean Physicists in America), 2012
- Grand prize, The 1st KOBIC Bioinformatics Contents Contest, 2007

**Conference**

- Best paper award, ACM Internet Measurement Conference (IMC, San Diego, California, USA), 2007
- Best oral presentation award, The 14th Workshop for Statistical Physics (Nami Island, Chuncheon, Korea), 2007

**Scholarship**

- ICTS fellow, Jacobs University 2007
- Scholarship from DAAD (Germany) and KOSEF (Korea), 2006

PUBLICATIONS  
(JOURNALS)

- [1] **Y.-Y. Ahn**, S. Ahnert, J. P. Bagrow, and A.-L. Barabási. Flavor network and the principles of food pairing. *Scientific Reports*, 1:196, 2011.
- [2] M. Cha, F. Benevenuto, **Y.-Y. Ahn**, and K. P. Gummadi. Delayed information cascades in flickr: Measurement, analysis, and modeling. *Computer Networks (in press)*, 2011.
- [3] Arabidopsis Interactome Mapping Consortium. Evidence for network evolution in an arabidopsis interactome map. *Science*, 333:601–607, 2011.
- [4] Y. Sohn, M. K. Choi, **Y.-Y. Ahn**, J. Lee, and J. Jeong. Topological cluster analysis reveals the systemic organization of the caenorhabditis elegans connectome. *PLoS Comp. Biol.*, 7:e1001139, 2011.
- [5] **Y.-Y. Ahn**, J. P. Bagrow, and S. Lehmann. Link communities reveal multi-scale complexity in networks. *Nature*, 466:761, 2010.
- [6] S. H. Lee, P.-J. Kim, **Y.-Y. Ahn**, and H. Jeong. Googling social interactions: web search engine based social network construction. *PLoS One*, 5:e11233, 2010.
- [7] Y. Shen, J. Liu, G. Estiu, B. Isin, **Y.-Y. Ahn**, D.-S. Lee, A.-L. Barabási, V. Kapatral, O. Wiest, and Z. N. Oltvai. A blueprint for antimicrobial hit discovery targeting metabolic networks. *PNAS*, 107:1082, 2010.
- [8] M. Cha, H. Kwak, P. Rodriguez, **Y.-Y. Ahn**, and S. Moon. Analyzing the video popularity characteristics of large-scale user generated content systems. *ACM/IEEE Transactions on Networking*, 17:1357, 2009.
- [9] F. Radicchi, **Y.-Y. Ahn**, and H. Meyer-Ortmanns. Impact of the updating scheme on stationary states of networks. *J. Phys. A: Math. Theor.*, 41:224010, 2008.
- [10] **Y.-Y. Ahn**, N. Masuda, H. Jeong, and J. D. Noh. Epidemic dynamics of two species of interacting particles on scale-free networks. *Phys. Rev. E*, 74:066113, 2006.
- [11] **Y.-Y. Ahn**, B. J. Kim, and H. Jeong. Wiring cost in the organization of a biological neuronal network. *Physica A*, 367:531, 2006.
- [12] J. D. Noh, H.-C. Jeong, **Y.-Y. Ahn**, and H. Jeong. Growing network model for community with group structure. *Phys. Rev. E*, 71:036131, 2005.
- [13] D.-H. Kim, S.-W. Son, **Y.-Y. Ahn**, P.-J. Kim, Y.-H. Eom, and H. Jeong. Underlying scale-free trees in complex networks. *Progress of Theoretical Physics Supplement*, 157:213, 2005.
- [14] S.-W. Son, D.-H. Kim, **Y.-Y. Ahn**, and H. Jeong. Response network emerging from simple perturbation. *J. Korean Phys. Soc.*, 44:628, 2004.

PUBLICATIONS  
(CONFERENCES,  
PEER-REVIEWED)

- [1] A. Mislove, S. Lehmann, **Y.-Y. Ahn**, J.-P. Onnela, and J. N. Rosenquist. Understanding The Demographics Of Twitter Users. In *Proceedings of the Fifth International AAAI Conference on Weblogs and Social Media (ICWSM'11)*, Barcelona, Spain, July 2011.
- [2] H. Chun, H. Kwak, Y.-H. Eom, **Y.-Y. Ahn**, S. Moon, and H. Jeong. Comparison of online social relations in terms of volume vs. interaction: a case study of cyworld. In *Proceedings of ACM Internet Measurement Conference (IMC'08)*, Vouliagmeni, Greece, October 2008.
- [3] M. Cha, H. Kwak, P. Rodriguez, **Y.-Y. Ahn**, and S. Moon. I tube, you tube, everybody tubes: Analyzing the world's largest user generated content video system. In *Proceedings of ACM Internet Measurement Conference (IMC'07)*, San Diego, CA, USA, October 2007.
- [4] **Y.-Y. Ahn**, S. Han, H. Kwak, S. Moon, and H. Jeong. Analysis of topological characteristics of huge online social networking services. In *Proceedings of the 16th International World Wide Web Conference (WWW'07)*, Banff, Alberta, Canada, May 2007.
- [5] S. Han, **Y.-Y. Ahn**, S. Moon, and H. Jeong. Collaborative blog spam filtering using adaptive percolation search. In *Proceedings of the 15th International World Wide Web Conference, workshop on the Weblogging Ecosystem (WWW'06)*, Edinburgh, Scotland, May 2006.

OTHER WORKS

- [1] A. Mislove, S. Lehmann, **Y.-Y. Ahn**, J.-P. Onnela, and J. N. Rosenquist. Pulse of the nation, 2010. Foosaner Art Museum, "The Art of Networks", [https://cs.fit.edu/Projects/complenet/2012/CompleNet\\_2012/The\\_Art\\_of\\_Networks.html](https://cs.fit.edu/Projects/complenet/2012/CompleNet_2012/The_Art_of_Networks.html).
- [2] A. Mislove, S. Lehmann, **Y.-Y. Ahn**, and C. Kliman-Silver. Tweets mentioning "earthquake" immediately following virginia earthquake on 08/23/2011, 2011. [http://www.youtube.com/watch?v=XJ1EQbmJ\\_LQ](http://www.youtube.com/watch?v=XJ1EQbmJ_LQ).
- [3] A. Mislove, S. Lehmann, **Y.-Y. Ahn**, J.-P. Onnela, and J. N. Rosenquist. Mapping the conversation: Political topics and geography on twitter, 2010. <http://election.ccs.neu.edu>.
- [4] **Y.-Y. Ahn**, S. Ahnert, J. P. Bagrow, and A.-L. Barabási. Flavor network, 2010. Edge-Serpentine Gallery exhibition, "Maps for the 21st Century", <http://www.edge.org/documents/Edge-Serpentine-MapsGallery/>.
- [5] A. Mislove, S. Lehmann, **Y.-Y. Ahn**, J.-P. Onnela, and J. N. Rosenquist. Pulse of the nation: Us mood throughout the day inferred from twitter, 2010. <http://www.ccs.neu.edu/home/amislove/twittermood/>.
- [6] **Y.-Y. Ahn**, J. P. Bagrow, S. Lehmann, and A. Pawling. Twittermood: United states map of mood, 2009. <http://twittermood.net>.

TALKS

**Invited conference talks and lectures**

- "Flavor network and the principles of food pairing"  
Gastronomy & Technology Days 2011  
(Telefonica, Barcelona, Spain) 10/18/2011
- "Hidden patterns in complex networks"  
2011 Summer School on Social Network Analysis  
(NIMS, Daejeon, South Korea) 08/06/2011
- "Community structure in dense social networks"  
Using online social networks research to improve health  
(Columbia University, New York, NY) 05/23/2011
- "Epidemics on networks"  
5th APCTP-KIAS Winter School on Statistical Physics  
(Phoenix park, South Korea) 01/28/2008

## Seminars

- “Complex networks, the hidden structures”  
Colloquium, Dept. of Physics, Ohio State University, OH 01/03/2012
- “Flavor network and the principles of food pairing”  
Dept. of Computer Science, KAIST, South Korea 07/18/2011
- “Hidden patterns in complex networks”  
BECS, Aalto University, Finland 05/09/2011
- “Mesoscopic structure of complex networks”  
Dept. of Physics, University of Notre Dame, IN 03/10/2011
- “Hidden patterns in complex networks”  
School of Informatics and Computing, Indiana University Bloomington, IN 03/03/2011
- “Link communities reveal multi-scale complexity in networks”  
Dept. of Brain and Cognitive Science, SNU, South Korea 11/26/2010  
Dept. of Computer Science, UMASS Boston, MA 10/14/2010  
SCANS seminar series, CCIS, Northeastern University, MA 10/05/2010  
APCTP, Pohang, South Korea 07/20/2010
- “Epidemics on networks”  
Dept. of Industrial & Systems Engineering, KAIST, South Korea 07/23/2010
- “Robustness of modular network and overlapping communities”  
Dept. of Computer Science, KAIST, South Korea 07/09/2010

## Selected list of talks

- Network Frontier Workshop, “Flavor network and the principles of food pairing” (Northwestern University, Evanston, IL, Dec. 2, 2011).
- Nordita Conference on Applications of Network Theory, “Flavor network and the principles of food pairing” (Stockholm, Sweden, Apr. 2011).
- APS March Meeting, “Flavor network and the principles of food pairing” (Dallas, TX, Mar. 2011).
- Nonequilibrium Statistical Physics of Complex Systems, “Overlapping community structure and the percolation transition of community network” (KIAS, South Korea, July, 2010).
- New Frontiers in Complex Networks, “Link communities reveal multiscale complexity in networks” (SNU, South Korea, July, 2010).
- NetSci10, “Overlapping community structure and the percolation transition of community network” (Boston, U.S., May. 2010).
- NetSci09, “Hierarchical link clustering in complex networks” (Venice, Italia, Aug. 2009).
- APS March Meeting, “Hierarchical link clustering in complex networks” (Pittsburgh, PA, Mar. 2009).
- APPC10: The 10th Asia Pacific Physics Conference, “Analysis of topological characteristics of huge online social networking services” (Postech, South Korea, Aug. 2007).
- WWW2007, “Analysis of topological characteristics of huge online social networking services” (Banff, Alberta, Canada, May 2007).
- 3rd Int. Conf. on NEWS, EXPECTATIONS and TRENDS in Statistical Physics, “Wiring Cost in the Organization of a Neural Network” (Kolymbari, Greece, Aug. 2005).

- STATPHYS22, “Role of wiring cost and pattern retrieval performance in the evolution of *C. elegans* neural network” (Bangalore, India, July 2004).
- ICCS2004, “Extremely clustered network” (Boston, USA, May 2004).

## SERVICE

### Reviewer

- Funding: NSF (2012)
- General: Scientific Reports, PLoS One
- Physics: Physical Review Letters, EPL, Physics Letters A, Physical Review E, Physica A, European Physical Journal B
- Biology: PLoS Computational Biology, BMC Systems Biology, IET Systems Biology
- Computer Science: WWW (2009), SIGKDD (2010), Journal of Computer-Mediated Communication

### PC member

- CompleNet (2010, 2012), WWW (2012)

## IN THE PRESS

### List of media coverages

- Our paper “Flavor network and the principles of food pairing” (*Scientific Reports* **1**, 196, 2011) was covered in some newspapers, magazines, and blogs. More comprehensive list can be found [here](#).
  - Mining molecular gastronomy. *Nature News* (December 15th, 2011).
  - Western-Asian Flavor Differences Revealed By New Study. *The Huffington Post* (December 15th, 2011).
  - Why do Western and Asian foods taste different? Study reveals that it’s all down to chemistry. *Mail Online* (December 19th, 2011).
  - Why Certain Flavor Combinations Melt In Your Mouth. *InsideScience.org* (December 23rd, 2011).
  - Why certain flavor combinations melt in your mouth. *Physorg.com* (December 26th, 2011).
  - Flavour Networks Shatter Food Pairing Hypothesis. *Technology Review, The Physics arXiv Blog* (November 29th, 2011).
  - Why Does Asian Food Taste So Different From Western Food? *Gizmodo* (December 18th, 2011).
  - What A Global Flavor Map Can Tell Us About How We Pair Foods. *NPR, the salt* (December 21st, 2011).
  - Backbone of the flavor network. *Flowing Data* (December 27th, 2011).
  - Shared flavor compounds show up on U.S. menus, rare in Asian cuisines. *IU News* (December 15th, 2011).
  - Adding the flavor to food science. *Northeastern News* (December 16th, 2011).
- Our project “Pulse of the nation: U.S. Mood Throughout the Day inferred from Twitter” was covered in several television programs, newspapers, and blogs. Most comprehensive list can be found [here](#). Some highlights are following:
  - Tweets Map the Countrys Mood. *CBS Evening News with Katie Couric* (July 23rd, video, transcript).
  - America’s moods mapped using Twitter. *Fox News 25* (July 23rd, 2010, video).
  - Scientists Use Twitter to Track Nations Mood. *Fox News* (July 28th, 2010, video).
  - Mapping Moods: Twitter Proves the West Coast is Happier. *CBS 3* (August 2nd, 2010, video).
  - When Life Is Sweet, According to Our Tweets. *New York Times* (July 24th, 2010).
  - 300 Million Tweets Reveal the Afternoon at Work Is the Unhappiest Time of Day. *New York Times, VentureBeat* (July 23rd, 2010).

- Tracking the National Mood Through Twitter. *New York Times, Bits* (July 22nd, 2010).
  - America: Are you Happy? *BBC* (July 23rd, 2010).
  - Thursday: Twitters Angriest Day. *Time Magazine* (July 22nd, 2010).
  - Are West Coast Tweeters Happier Than Their East Coast Counterparts? *Vanity Fair* (July 22nd, 2010).
  - Twitter Reveals West Coast Happier Than East Coast, Say Scientists. *New York Magazine* (July 22nd 2010).
  - Proof From Twitter Research: Floridians Happier Than Rest of the Bitter Nation. *Miami New Times* (July 22nd, 2010).
  - California much more jovial than East Coast, study finds. *LA Times* (July 23rd, 2010).
  - Twitter Used To Gauge The Nation's Mood. *Wall Street Journal* (July 24th, 2010).
  - Study of Twitter users finds daily, hourly mood swings. *USA Today* (July 28th, 2010).
  - Twitter Visualization Shows When We Are Happiest. *SF Gate/San Francisco Chronicle* (July 21st, 2010).
  - Twitter Mood: The Pulse of the Nation. *CBS News* (July 22nd, 2010).
  - Happy People: Researchers Pinpoint Smiles (And Frowns) Using Twitter. *National Public Radio* (July 23rd, 2010). *all tech considered*.
  - Is The West Coast Happier? Twitter Says Yes. *National Public Radio* (July 22nd, 2010). *[The Picture Show]*
  - Time-Lapse Twitter Visualization Shows America's Moods. *Mashable* (July 21st, 2010).
  - Twitter Mood Map Tracks The Nation's Happiness. *Huffington Post* (July 23rd, 2010).
  - Twitter finds West Coast is happier than East. *CNET* (July 22nd, 2010).
  - Researchers Analyze 300 Million Tweets to Create Mood Ring for America. *Gawker* (July 22nd, 2010).
  - Map Measures U.S. Mood on Twitter. *Technorati* (July 22nd, 2010).
  - Twitter Gauges Nation's Mood. *The Daily Beast* (July 23rd, 2010).
  - Twitter Research Proves California Is a Far Happier Place Than New York. *Slate* (July 16th, 2010). *[The Big Money]*
  - The moodiness of the US, as told by Twitter. *Engadget* (July 27th, 2010).
  - Do we tweet when we are in certain moods? *Big Questions online* (July 26th, 2010).
  - Is twitter a national mood ring? *CNN* (August 6th, 2010).
- Our paper "Link communities reveal multiscale complexity in networks" (*Nature* **466**, 761, 2010) was featured on *Northeastern News* and *Science On (Hankyoreh)*.
  - Our paper "Googling social interactions: Web search engine based social network construction" (*PLoS One* **5**, e11233, 2010) was featured on *New Scientist* and *Pocket Science*.