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HIGHLIGHTS	<p><b>Highly cited research</b> (H-index: <b>35</b>, i10-index: <b>67</b>, Lifetime citations &gt; <b>17k</b>)</p> <ul style="list-style-type: none"> <li>• Twitter as an information network [C8]: <b>9,477 times</b></li> <li>• YouTube video popularity characterization [C3]: <b>2,150 times</b></li> <li>• Huge online social network (OSN) analysis [C2]: <b>1,383 times</b></li> </ul> <p><b>Computational Social Science</b></p> <ul style="list-style-type: none"> <li>• Halo effects on social media: ICWSM'20 [C48]</li> <li>• Polarization on social media: ACM TSC'22 [J14], ICWSM'19 [C42]; ICWSM'16 [C23]</li> <li>• Cyberbullying and online toxic behavior: EMNLP'21 Findings [C52], ICWSM'18 [C40], CHI'15 [C21], WWW'14 [C15] (featured by <a href="#">Nature News</a>, <a href="#">Scientific American</a>, etc.)</li> <li>• User behavior in extreme situations: WWW Companion'17 [C27] (covered by <a href="#">New Scientist</a>, <a href="#">Daily Mail</a>, etc.)</li> <li>• Alt-right community analysis: WWW Companion'18 [C38] (featured by <a href="#">New Scientist</a>, <a href="#">Vice</a>, etc.)</li> <li>• Structures and dynamics of social media: WWW'10 [C8] (featured by <a href="#">Mashable Op-Ed</a>, <a href="#">Readwrite</a>, <a href="#">The Guardian</a>, <a href="#">MIT Technology Review</a>, etc.), CSCW'13 [C13], ICWSM'12 [C12], CHI'11 [C10] (featured by <a href="#">Kyunghyang</a>)</li> </ul> <p><b>Computational journalism</b></p> <ul style="list-style-type: none"> <li>• Media profiling and media bias: ACL'20 [C49], WebSci'20 [C50], EMNLP'19 Demo [C45] (featured by <a href="#">Forbes</a>, <a href="#">MIT Technology Review</a>, <a href="#">Wired</a>, <a href="#">Engadget</a>, etc.)</li> <li>• Media attention and public attention: TheWeb'18 [C35]</li> <li>• Media attention and disregard network: ASONAM'17 [C32]</li> <li>• Sentiment of news headlines: ICWSM'15 [C22] (featured by <a href="#">O Globo</a>)</li> <li>• Bias in foreign news coverage: Computation+Journalism Symposium'14 (featured by <a href="#">MIT Technology Review</a>, <a href="#">ACM Tech News</a>, etc.)</li> </ul> <p>INTERESTS</p> <p>My research interests are data-driven modeling and large-scale analysis of online systems from social media to online games to better understand social phenomena. Recently, I more focus on understanding the obstacles to the trusted public space online in a data-driven way. In particular, I define <i>media bias</i>, <i>toxicity</i>, <i>polarization</i>, and <i>unfair representations</i> as the four major obstacles to the trusted web. I aim to develop methodologies to model them, construct transparent frameworks to monitor them at large-scale in real-time, and make the online public space more trustable.</p>

EDUCATION	Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea	
	Ph.D. in Computer Science	August 2011
	Advisor: <a href="#">Professor Sue Moon</a>	
	Dissertation: Multi-level Analysis on Structures and Dynamics of Online Social Networks	
	M.S. in Computer Science	August 2007
	B.S. in Computer Science	February 2006
PROFESSIONAL EXPERIENCE	<b>Indiana University Bloomington</b> , IN, USA	
	Associate Professor	Jan 2023 - Present
	<b>Singapore Management University</b> , Singapore	
	Associate Professor	Oct 2020 - Dec 2022
	<b>Qatar Computing Research Institute, HBKU</b> , Doha, Qatar	
	Senior Scientist	Jul 2016 - Sep 2020
	Scientist	Apr 2014 - Jun 2016
	<b>Telefonica Research</b> , Barcelona, Spain	
	Researcher	Jun 2012 - Apr 2014
	<b>KAIST</b> , Daejeon, Korea	
	Research Assistant	Aug 2011 - Oct 2011
	<b>Telefonica Research</b> , Barcelona, Spain	
	Intern	Sep 2007 - Dec 2007
AWARDS	2022	ACM Internet Measurement Conference Test of Time Award, Nice, France
	2021	The D.S. Lee Foundation Fellowship (2021-22)
	2021	<a href="#">AI 2000 Most Influential Scholars Honorable Mention (Human-Computer Interaction, 2011-2020)</a> by <a href="#">AMiner</a>
	2021	Best reviewer award, The Web conference, Virtual conference
	2020	<a href="#">AI 2000 Most Influential Scholars (Information Retrieval and Recommendation, 2010-2019)</a> by <a href="#">AMiner</a>
	2019	Best paper award, International Conference on Social Informatics (SocInfo), Doha, Qatar
	2018	<a href="#">HBKU Innovation Idea Development Grants</a> , Doha, Qatar
	2016	<a href="#">Qatar Science &amp; Technology Park (QSTP) Accelerator program</a> , Doha, Qatar
	2011	Best Ph.D. Thesis, KAIST Computer Science Department, Daejeon, Korea
	2007	Best paper award, ACM Internet Measurement Conference, San Diego, CA, USA

- [J14] Y. Mejova, J. An, G.D.F. Morales, and **H. Kwak**. Modeling political activism around gun debate via social media. *ACM Transactions on Social Computing*, 2022
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- [J12] H. Almerexhi, **H. Kwak**, and B.J. Jansen. Investigating toxicity changes of cross-community redditors from 2 billion posts and comments. *PeerJ Computer Science*, 8:e1059, 2022
- [J11] Claire Seungeun Lee, Juan Merizalde, John D Colautti, Jisun An, and **H. Kwak**. Storm the capitol: Linking offline political speech and online twitter extra-representational participation on qanon and the january 6 insurrection. *Frontiers in Sociology*, 7, 2022
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- [J8] **H. Kwak**, J. An, E. Jing, and Y.-Y. Ahn. Frameaxis: characterizing microframe bias and intensity with word embedding. *PeerJ Computer Science*, 7:e644, 2021
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- [J6] J. An, **H. Kwak**, S. Jung, J. Salminen, M. Admad, and B.J. Jansen. Imaginary people representing real numbers: generating personas from online social media data. *ACM Transactions on the Web (TWEB)*, 12(4):27, 2018
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- [J2] **H. Kwak**, S. Moon, Y. Eom, Y. Choi, and H. Jeong. Consistent community identification in complex networks. *Journal of the Korean Physical Society*, 59(5):3128–3132, 2011
- [J1] M. Cha, **H. Kwak**, P. Rodriguez, Y. Ahn, and S. Moon. Analyzing the video popularity characteristics of large-scale user generated content systems. *IEEE/ACM Transactions on Networking*, 17(5):1357–1370, Oct 2009

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- [C57] K. Miyazaki, T. Murayama, A. Matsui, M. Nishikawa, T. Uchiba, **H. Kwak**, and J. An. Political honeymoon effect on social media: Characterizing social media reaction to the changes of prime minister in Japan. In *Proceedings of the 15th International ACM Conference on Web Science (WebSci)*. ACM, 2023 (accepted)
- [C56] K. Miyazaki, T. Uchiba, **H. Kwak**, and J. An. MAANG? MANGA? characterizing spontaneous ideation contest on social media: Case study on the name change of Facebook to Meta. In *2022 IEEE International Conference on Big Data (Big Data)*, pages 776–783, 2022
- [C55] **H. Kwak**. You have earned a trophy: Characterize in-game achievements and their completions. In *Proceedings of the 14th International ACM Conference on Web Science (WebSci)*. ACM, 2022
- [C54] Y. Y. Chong and **H. Kwak**. Understanding toxicity triggers on reddit in the context of singapore. In *Proceedings of the 16th International AAAI Conference on Web and Social Media (ICWSM) (Short paper)*, 2022
- [C53] **H. Kwak**, J. An, and K. Park. Who is missing? characterizing the participation of different demographic groups in a korean nationwide daily conversation corpus. In *Proceedings of the 16th International AAAI Conference on Web and Social Media (ICWSM) (Short paper)*, 2022
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- [C50] **H. Kwak**, J. An, and Y.-Y. Ahn. A systematic media frame analysis of 1.5 million new york times articles from 2000 to 2017. In *Proceedings of the 12th International ACM Conference on Web Science (WebSci)*. ACM, 2020
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- [C18] **H. Kwak** and J. Blackburn. Linguistic analysis of toxic behavior in an online video game. In *Workshop on Exploration on Games and Gamers co-located with international Conference on Social Informatics*, pages 209–217. Springer, 2014
- [C17] L. Gyarmati, **H. Kwak**, and P. Rodriguez. Searching for a unique style in soccer. In *2014 KDD Workshop on Large-Scale Sports Analytics*, 2014
- [C16] M. Martin, R.D. Oliveira, **H. Kwak**, , and N. Oliver. Didn’t you see my message?: predicting attentiveness to mobile instant messages. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, pages 3319–3328. ACM, 2014
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- [C10] **H. Kwak**, H. Chun, and S. Moon. Fragile online relationship: a first look at unfollow dynamics in Twitter. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, pages 1091–1100. ACM, 2011
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- [C8] **H. Kwak**, C. Lee, H. Park, and S. Moon. What is Twitter, a social network or a news media? In *Proceedings of the 19th international conference on World wide web*, pages 591–600. ACM, 2010
- [C7] S. Moon, J. You, **H. Kwak**, D. Kim, and H. Jeong. Understanding topological mesoscale features in community mining. In *2010 Second International Conference on COMMunication Systems and NETWORKS (COMSNETS 2010)*, pages 1–10. IEEE, 2010
- [C6] **H. Kwak**, Y. Choi, Y. Eom, H. Jeong, and S. Moon. Mining communities in networks: a solution for consistency and its evaluation. In *Proceedings of the 9th ACM SIGCOMM conference on Internet measurement*, pages 301–314. ACM, 2009
- [C5] X. Amatriain, N. Lathia, J. Puyol, **H. Kwak**, and N. Oliver. The wisdom of the few: a collaborative filtering approach based on expert opinions from the web. In *Proceedings of the 32nd international ACM SIGIR conference on Research and development in information retrieval*, pages 532–539. ACM, 2009

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- [C3] 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 the 7th ACM SIGCOMM Conference on Internet Measurement*, IMC '07, pages 1–14, New York, NY, USA, 2007. ACM
- [C2] 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 Conference on World Wide Web*, WWW '07, pages 835–844, New York, NY, USA, 2007. ACM
- [C1] **H. Kwak**, S. Han, Y.-Y. Ahn, S. Moon, and H. Jeong. Impact of snowball sampling ratios on network characteristics estimation: A case study of cyworld. In *Proceedings of the Korean Information Science Society Conference*, 2006

## Patents

- [P4] N. Oliver M. Pielot, **H. Kwak**, and R. Oliveira. Method for predicting reactiveness of users of mobile devices for mobile messaging, June 25 2015. US Patent App. 14/577,488
- [P3] **H. Kwak** and E. Martinez. Method, system and computer-readable storage mediums for estimating a route, January 8 2015. US Patent App. 14/323,186
- [P2] S. Moon, **H. Kwak**, H. Shin, and J. Yoon. System and method for extracting users of similar interests between various types of web servers, April 16 2013. US Patent 8,423,542
- [P1] X. Amatriain, J. Puyol, N. Lathia, P. Rodriguez, and **H. Kwak**. Recommender system based on expert opinions, June 9 2011. US Patent App. 12/630,606

## TEACHING EXPERIENCE

**Singapore Management University**, Singapore

*Instructor*

AY2021-22T1, AY2022-23T1

[Fairness in Socio-technical Systems](#)

**Singapore Management University**, Singapore

*Instructor*

AY2021-22T1, AY2022-23T1

Intro to Programming

**Singapore Management University**, Singapore

*Instructor*

AY2020-21T2

Data Management

## PROFESSIONAL SERVICE

### Editorial services

- Editorial board member, [Online Social Networks and Media](#) (Science Citation Index Expanded journal): 2019-present
- Editorial board member, [Digital Journalism](#) (2018 Impact Factor 2.679): 2020-

### Organization

- Virtual experience chair, The fifth annual ACM FAccT conference, Seoul, Korea (2022)



- Co-organizer, 4th International Workshop on NEws and publiC Opinion (NECO 2020) co-located with ICWSM'20, Atlanta, GA, USA (2020)
- Co-organizer, Workshop on Bias, Disinformation, Misinformation, and Propaganda in Online News and in Social Media co-located with SocInfo'19, Doha, Qatar (2019)
- Workshop chair, 29th ACM Conference on Hypertext and Social Media (HT), Baltimore, Maryland, USA (2018)
- Co-organizer, 3rd International Workshop on NEws and publiC Opinion (NECO 2018) co-located with ICWSM'18, Stanford, CA, USA (2018)
- Co-organizer, 4th workshop on Social News on the Web (SNOW 2017) Co-located with WWW'17, Perth, Australia (2017)
- Co-organizer, 2nd International Workshop on NEws and publiC Opinion (NECO 2017) co-located with ICWSM'17, Montreal, Canada (2017)
- Co-organizer, 3rd workshop on Social News on the Web (SNOW 2016) Co-located with WWW'16, Montreal, Canada (2016)
- Co-organizer, 1st International Workshop on NEws and publiC Opinion (NECO 2016) co-located with ICWSM'16, Cologne, Germany (2016)
- Track chair (with Alessandra Sala and Aristides Gionis), Social Networks and Graph Analysis Track in 2016 International World Wide Web Conference, Montreal, Canada (2016)
- Co-organizer, 1st International Workshop on Exploration Games and Gamers (EGG) co-located with SocInfo'14, Barcelona, Spain (2014)
- Registration chair, ACM Internet Measurement Conference (IMC), Barcelona, Spain (2013)

#### **Program Committee Member**

- The Web (WWW) Web and Society Track Senior PC: 2023
- The Web (WWW) Web and Society Track PC: 2018, 2019, 2020, 2021, 2022
- The Web (WWW) Fairness, Accountability, Transparency, and Ethics on the Web Track PC: 2023
- ICWSM Senior PC: 2014, 2018, 2019, 2020, 2021, 2022, 2023
- ACL Computational Social Science and Cultural Analytics Track: 2023
- AAAI/ACM Conference on AI, Ethics, and Society (AIES) PC: 2022
- EACL Ethical and Sustainable NLP track: 2023
- AACL-IJCNLP: 2022
- NETSCI Computer Science Track: 2020 (cancelled due to Covid-19)
- SocInfo PC: 2014, 2015, 2016, 2020
- ACL NLP and Application Track: 2020
- The Web (WWW) Social Network and Graph Analysis Track: 2014, 2015, 2016, 2018, 2019, 2021
- Complex Networks: 2017, 2018, 2020, 2021, 2022
- IEEE ICDCS Social Networks and Crowdsourcing: 2018
- European Symposium Societal Challenges in Computational Social Science: 2017
- LC2S2 (At the crossroads: lessons and challenges in Computational Social Science): 2016

- ACM WebSci: 2014, 2022
- ACM Hypertext: 2014
- The Web (WWW) Poster: 2014
- ICWSM PC: 2013
- European Conference on Complex Systems (ECCS): 2013

#### **Program Committee Member - Workshop**

- ACL NLP COVID-19 Workshop: 2020
- CIKM MAISoN Workshop: 2020
- WWW Cybersafety Workshop: 2018, 2019, 2020
- ACL Abusive Language Workshop (ALW): 2019
- ACL Workshop on NLP and Social Dynamics: 2014
- CIKM Rumours and Deception in Social Media Workshop: 2018
- WWW Connecting online and offline life (COOL) Workshop: 2014
- WWW Simplifying Complex Networks for Practitioners (SIMPLEX) Workshop: 2014
- SocInfo Interaction and Exchange in Social Media Workshop: 2014
- CIKM Search and Mining User-generated Contents Workshop: 2013

#### **Best Paper Committee**

- ACM WebSci'22

#### **IN THE PRESS**

#### **Selected list of media coverages**

- “Investigating toxicity changes of cross-community redditors from 2 billion posts and comments” (PeerJ CS'22)
  - [New Scientist](#)
  - [NewsWise](#)
  - [Independent](#)
  - [DailyMail](#)
  - [PeerJ Spotlight](#)
- “Understanding Toxicity Triggers on Reddit in the Context of Singapore” (ICWSM'22)
  - [AI Ethics Brief Newsletter #111 by Montreal AI Ethics Institute](#)
- “Tanbih: Get to Know What You Are Reading” (EMNLP Demo'19)
  - [Forbes](#)
  - [Boston Globe](#)
  - [Aljazeera](#)
  - [MIT Technology Review](#)
  - [Science Daily](#)
  - [Popular Science](#)
  - [Fast Company](#)
  - [The Register](#)
  - [WIRED](#)

- [Engadget](#)
- “What is Gab? A Bastion of Free Speech or an Alt-Right Echo Chamber?” (WWW Cybersafety workshop’18)
  - [New Scientist](#)
  - [Vice](#)
- “Data-driven Approach to Measuring the Level of Press Freedom Using Media Attention Diversity from Unfiltered News” (ICWSM’17)
  - [The Best of the Physics arXiv \(week ending April 15, 2017\) in MIT Technology Review](#)
- “I Would Not Plant Apple Trees If the World Will Be Wiped: Analyzing Hundreds of Millions of Behavioral Records of Players During an MMORPG Beta Test” (WWW Companion’17)
  - [New Scientist](#)
  - [Daily Mail](#)
  - [IFL Science](#) (18.1K shared)
  - [PC Gamer](#)
  - [Massively Overpowered](#)
  - [4Gamers](#)
  - [El Confidencial](#)
  - [Joongang Ilbo](#)
  - [How Stuff Works](#)
  - [PC Gamer](#)
  - [Digital Trends](#)
  - [Engadget](#)
- “Revealing the Hidden Patterns of News Photos: Analysis of Millions of News Photos Using GDELT and Deep Learning-based Vision APIs” (ICWSM Workshop on News and Public Opinion’16)
  - [The Best of the Physics arXiv \(week ending March 26, 2016\) in MIT Technology Review](#)
- “Breaking the News: First Impressions Matter on Online News” (ICWSM’15)
  - [Other Interesting arXiv Papers \(Week ending April 11, 2015\) in MIT Technology Review](#)
  - [O Globo](#)
  - [Engadget](#)
- “Understanding News Geography and Major Determinants of Global News Coverage of Disasters” (Computation+Journalism Symposium’14)
  - [MIT Technology Review](#)
  - [ACM Tech News](#)
- “Searching for a Unique Style in Soccer” (KDD Workshop on Large-scale Sports Analytics’14)
  - [BBC](#)
  - [MIT Technology Review](#)
  - [The Sunday Times](#)
  - [The Economist](#)

- [Slate](#)
- [Pacific Standard](#)
- “Linguistic Analysis of Toxic Behavior in an Online Video Game” (SocInfo Workshop on Exploration Games and Gamers’14)
  - [Other Interesting arXiv Papers \(Week ending November 1, 2014\) in MIT Technology Review](#)
- “STFU NOOB! Predicting Crowdsourced Decisions on Toxic Behavior in Online Games” (WWW’14)
  - [Nature News](#)
  - [Scientific American](#)
  - [Hybrid](#)
  - [Kincir](#)
  - [Chosun Ilbo](#)
- “Fragile Online Relationship: a First Look at Unfollow Dynamics in Twitter” (CHI’11)
  - [Kyunghyang Shinmun](#)
- “What is Twitter, a Social Network or a News Media?” (WWW’10)
  - [Mashable](#)
  - [Readwrite](#)
  - [Gigamon](#)
  - [The Guardian](#)
  - [PC World](#)
  - [MIT Technology Review](#)
  - [Chosun Ilbo](#)
  - [Dong-A Ilbo](#)
- “I Tube, You Tube, Everybody Tubes: Analyzing the World’s Largest User Generated Content Video System” (IMC’07)
  - [Work Today](#)
  - [Financial News](#)

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