# Hong-Kyun Bae

Future Hall-715, Kookmin University, Seoul, Republic of Korea 02707
✉ hongkyun@kookmin.ac.kr (02-910-5652)

## PERSONAL STATEMENT

Proven excellence in data mining and recommender systems research demonstrated through ***extensive publication in BK21-recongnized top conferences*** *and SCI(E) journals*, along with numerous *international and domestic patents* granted/filed. Holds a Ph.D. and a B.S. in Computer Science.

## EDUCATION

**Ph.D. in Computer Science** **Sep. 2016 – Aug. 2024**
Hanyang University, Seoul, Republic of Korea
***Advisor**: Prof. Sang-Wook Kim, Hanyang University*

**B.S. in Computer Science** **Mar. 2009 – Aug. 2016**
Inha University, Incheon, Republic of Korea

## EXPERIENCE

**Assistant Professor** **Mar. 2025 – Current**
Kookmin University, Seoul, Republic of Korea

**Postdoctoral Researcher** **Sep. 2024 – Feb. 2025**
Hanyang University, Seoul, Republic of Korea

**Visiting Scholar** **Sep. 2023 – Dec. 2023**
The Pennsylvania State University, State College, PA, USA

## RESEARCH INTERESTS

*Data mining; Recommender systems; Deep learning*

## INTERNATIONAL PUBLICATIONS

### JOURNAL PAPERS

**[j2]** **Hong-Kyun Bae***, Jiyeon Kim*, Jongwuk Lee, and Sang-Wook Kim, "**DUET: Dually Guided Knowledge Distillation from Explicit Feedback**," ***Information Fusion***, Vol. 120, pp. 1-13, Aug. 2025. (* co-first authors with equal contribution) (**SCIE, IF (JCR 2023): 14.8, Top 1%**)

**[j1]** **Hong-Kyun Bae**, Hyung-Ook Kim, Won-Yong Shin, and Sang-Wook Kim, "**How to Get Consensus with Neighbors?: Rating Standardization for Accurate Collaborative Filtering**," ***Knowledge-Based Systems***, Vol. 234, pp. 1-13, Dec. 2021. (**SCIE, IF (JCR 2023): 7.2, Top 15%**)

### CONFERENCE PAPERS

**[c11]** **Hong-Kyun Bae***, Hae-Ri Jang*, Yang-Sae Moon, and Sang-Wook Kim, "**Item-Ranking Promotion in Recommender Systems,**" In *Companion Proceeding of the ACM Web Conference* (**ACM WWW**) pp. 505-508, Singapore, Singapore, May 13-17, 2024. (* co-first authors with equal contribution) **(Short paper)** (**BK21 IF: 4**)

**[c10]** Jeewon Ahn**, Hong-Kyun Bae**, and Sang-Wook Kim, "**Is the 'Impression Log' Beneficial to Evaluating News Recommender Systems? No, it is Not,**" In *Companion Proceeding of the ACM Web Conference* (**ACM WWW**)

pp. 822-825, Singapore, Singapore, May 13-17, 2024. **(Short paper)** (**BK21 IF: 4**)

**[c9]** **Hong-Kyun Bae***, Yebeen Kim*, Hyunjoon Kim, and Sang-Wook Kim, "**Negative Sampling in Next-POI Recommendations: Observation, Approach, and Evaluation,**" In *Proceeding of the ACM Web Conference* (**ACM WWW**) pp. 3888-3899, Singapore, Singapore, May 13-17, 2024. (* co-first authors with equal contribution) **(Full paper)** (**BK21 IF: 4**)

**[c8]** Jeewon Ahn***, Hong-Kyun Bae***, and Sang-Wook Kim, "**Is the Impression Log Beneficial to Effective Model Training in News Recommender Systems? No, It's NOT,**" In *Proceeding of the ACM Web Conference* (**ACM WWW**) pp. 61-64, Austin, TX, USA, April 30-May 4, 2023. (* co-first authors with equal contribution) **(Short paper)** (**BK21 IF: 4**)

**[c7]** **Hong-Kyun Bae**, Yeon-Chang Lee, Kyungsik Han, and Sang-Wook Kim, "**A Competition-Aware Approach to Accurate TV Show Recommendation,**" In *Proceeding of the IEEE International Conference on Data Engineering* (**IEEE ICDE**) pp., Anaheim, CA, USA, April 3-7, 2023. (accepted to appear) **(Full paper)** (**BK21 IF: 3**)

**[c6]** **Hong-Kyun Bae**, Jeewon Ahn, Dongwon Lee, and Sang-Wook Kim, "**LANCER: A Lifetime-Aware News Recommender System,**" In *Proceeding of the AAAI Conference on Artificial Intelligence* (**AAAI**) pp., Washington DC, USA, February 7-14, 2023. (accepted to appear) **(Full paper)** (**BK21 IF: 4**)

**[c5]** **Hong-Kyun Bae**, Jeewon Ahn, and Sang-Wook Kim, "**A Comparative Study for State-of-the-Art News Recommendation Methods,**" In *Proceeding of the International Conference on Next Generation Computing* (**ICNGC**) pp. 140-142, Jeju, Korea, October 13-16, 2022. **(Short paper)**

**[c4]** Hongjun Lim*, Yeon-Chang Lee*, Jin-Seo Lee, Sanggyu Han, Seunghyeon Kim, Yeongjong Jeong, Changbong Kim, Jaehun Kim, Sunghoon Han, Solbi Choi, Hanjong Ko, Dokyeong Lee, Jaeho Choi, Yungi Kim, **Hong-Kyun Bae**, Taeho Kim, Jeewon Ahn, Hyun-Soung You, and Sang-Wook Kim, "**AiRS: A Large-Scale Recommender System at NAVER News,**" In *Proceeding of the IEEE International Conference on Data Engineering* (**IEEE ICDE**) pp. 3386-3398, Virtual Conference, May 9-12, 2022. **(Full paper)** (**BK21 IF: 3**)

**[c3]** Sung-Jun Park*, Dong-Kyu Chae*, **Hong-Kyun Bae**, Sumin Park and Sang-Wook Kim, "Reinforcement Learning over Sentiment-Augmented Knowledge Graphs towards Accurate and Explainable Recommendation**,**" In *Proceeding of the ACM International Conference on Web Search and Data Mining* (**ACM WSDM**) pp. 784-793, Virtual Conference, February 21-25, 2022. **(Full paper)** (**BK21 IF: 3**)

**[c2]** Yunyong Ko**,** Jae-Seo Yu, **Hong-Kyun Bae**, Yongjun Park, Dongwon Lee, and Sang-Wook Kim, "**MASCOT: A Quantization Framework for Efficient Matrix Factorization in Recommender Systems,**" In *Proceeding of the IEEE International Conference on Data Mining* (**IEEE ICDM**) pp., Virtual Conference, December 7-10, 2021. **(Full paper)** (**BK21 IF: 3**)

**[c1]** **Hong-Kyun Bae**, Yeon-Chang Lee, and Sang-Wook Kim, "**TV Show Recommendation: Methods and Evaluation,**" In *Proceeding of the International Conference on Convergence Content* (**ICCC**) pp. 413-414, Busan, Korea, November 12-14, 2020. **(Short paper)**

## DOMESTIC PUBLICATIONS

### JOURNAL PAPERS

**[j1]** "**익스플리싯 피드백 환경에서 추천 시스템을 위한 최신 지식증류기법들에 대한 성능 및 정확도 평가**," **스마트미디어저널** Vol.12, No.9, pp. 89-94, Oct. 2023.

### CONFERENCE PAPERS

**[c10]** "**이윤 고려 추천 시스템에 대한 비교 평가 (Profit-Aware Recommender Systems: A Comparative Study)**," *한국정보처리학회 춘계학술대회* (**Annual Spring Conference of KIPS 2023**), pp. 501-503, May 18-20, 2023. (***Excellent Paper Award***)

**[c9]** "**체크인 시퀀스 기반의 Next POI 추천 시스템을 위한 네거티브 샘플링 방법 (A Negative Sampling Method for Next POI Recommender Systems Based on Check-in Sequences)**," *한국정보처리학회 춘계학술대회* (**Annual Spring Conference of KIPS 2023**), pp. 470-472, May 18-20, 2023. (***Excellent Paper Award***)

**[c8]** "**차량 운전자의 내비게이션 사용 이력 데이터셋을 활용한 개인화 POI 추천 시스템 (A Personalized POI Recommender System Using Driver's Navigation History)**," *한국컴퓨터종합학술대회* (**Korea Computer Congress 2022**), pp. 564-566, June 29-July 1, 2022.

**[c7]** "**다중 클래스 환경의 추천 시스템을 위한 지식 증류 기법들의 비교 분석 (Knowledge Distillation for Recommender Systems in Multi-Class Settings: Methods and Evaluation)**," *한국정보처리학회 춘계학술대회* (**Annual Spring Conference of KIPS 2022**), pp. 356-358, May 19-21, 2022.

**[c6]** "**멀티 클래스 환경에서 추천을 위한 지식 증류를 이용하는 딥러닝 기반의 행렬 분해 기법 (Deep Learning-based Matrix Factorization with Knowledge Distillation for Recommendation in Multi-Class Environment)**," *한국컴퓨터종합학술대회* (**Korea Computer Congress 2021**), pp. 1990-1992, June 23-25, 2021. (***Participation Award***)

**[c5]** "**추천 시스템에서의 효율적인 행렬 분해 모델을 위한 정밀도 변환 기법 (Precision Switching for Efficient Matrix Factorization in Recommender Systems)**," *한국정보처리학회 춘계학술대회* (**Annual Spring Conference of KIPS 2021**), pp. 314-315, May 14-15, 2021.

**[c4]** "**다중클래스 피드백을 이용한 지식증류기법 기반의 추천시스템 정확도 평가 (On Evaluating Recommender Systems with Knowledge Distillation in Multi-Class Feedback Environment)**," *한국정보처리학회 춘계학술대회* (**Annual Spring Conference of KIPS 2021**), pp. 310-311, May 14-15, 2021.

**[c3]** "**객체 간 관계 정보를 포함하는 지식 그래프 구축 기법 및 추천 시스템에서의 활용 방안 (An Approach to Constructing Knowledge Graph for Recommender Systems based on Object Relations)**," *한국정보처리학회 추계학술대회* (**Annual Conference of KIPS 2020**), pp. 759-760, November 6-7, 2020.

**[c2]** "**랜덤워크 기법을 위한 GPU 기반 희소행렬 벡터 곱셈 방안에 대한 성능 평가 (GPU-based Sparse Matrix-Vector Multiplication Schemes for Random Walk with Restart: A Performance Study)**," *한국정보처리학회 추계학술대회* (**Annual Conference of KIPS 2020**), pp. 96-97, November 6-7, 2020.

**[c1]** "**협업 필터링을 위한 듀얼 벡터 표기 방식 기반 오토인코더 (Dual Representation-based Autoencoder for Collaborative Filtering)**," *한국소프트웨어종합학술대회* (**Korea Software Congress 2019**), pp. 99-101, December 18-20, 2019. (***Best Paper Award***)

## PATENTS

### INTERNATIONAL PATENTS

**[p2]** **"Method for Optimizing Performance of Algorithm Using Precision Scaling,"** Registration number: US11537395, Registration date: December 27, 2022. (**USA**)

**[p1]** **"Method and System for Knowledge Distillation Technique in Multiple Class Collaborative Filtering Environment,"** Application number: 17/979,487, Application date: November 2, 2022. (**USA**)

### DOMESTIC PATENTS

**[p10]** ″**감정 요소가 결합된 지식 그래프와 강화학습을 이용한 설명 가능한 추천 시스템 (Incorporating Sentiment on Relations into Knowledge Graph and Reinforcement Learning towards Explainable Recommendation)**,″ Registration number: 10-2633688, Registration date: January 31, 2024.

**[p9]** ″**정밀도 스케일링을 적용한 추천 알고리즘 성능 최적화 기법 (Optimization Method of Recommendation Algorithm using Precision Scaling)**,″ Registration number: 10-2380437, Registration date: March 25, 2022.

**[p8]** ″**경쟁 기반의 TV 프로그램 추천 방법 및 그 시스템 (A Competition-Aware Approach to Accurate TV Show Recommendation)**,″ Registration number: 10-2372712, Registration date: March 4, 2022.

**[p7]** ″**효과적인 협업필터링 기반 추천시스템을 위하여 이웃의 평점 정보를 이용하는 평점 표준화 방법 (Method and Apparatus for Recommending Items based on Standardized Ratings)**,″ Registration number: 10-2200340, Registration date: January 4, 2021.

**[p6]** ″**추천 시스템의 이윤 최대화를 위한 리스트 별 순위 학습 방법 및 그 시스템 (A List-wise Learning-to-Rank Framework for Profit Maximization of Recommender Systems)**,″ Application number: 10-2024-0036326, Application date: March 15, 2024.

**[p5]** ″**Next-POI 추천을 위한 네거티브 POI 샘플링 방법 및 그 시스템 (A Negative POI Sampling Method for Next-POI Recommender Systems)**,″ Application number: 10-2024-0036325, Application date: March 15, 2024.

**[p4]** ″**아이템 랭킹 승격 기반의 추천 방법 및 그 시스템 (Item-Ranking Promotion in Recommender Systems)**,″ Application number: 10-2023-0116596, Application date: September 4, 2023.

**[p3]** ″**수명 기반의 뉴스 추천 방법 및 그 시스템 (A Lifetime-Aware News Recommender System)**,″ Application number: 10-2023-0064160, Application date: May 18, 2023.

**[p2]** ″**다중 클래스 협업 필터링 환경에서 지식증류기법 사용을 위한 방법 및 장치 (A Collaborative Filtering with Knowledge Distillation in Multi-class Feedback Environment)**,″ Application number: 10-2022-0074989, Application date: June 20, 2022.

**[p1]** ″**추천시스템에서의 효율적인 행렬 분해를 위한 양자화 프레임워크 (A Quantization Framework for Efficient Matrix Factorization in Recommender Systems)**,″ Application number: 10-2021-0184046, Application date: December 21, 2021.

## PROJECTS

- Institute of Information & Communications Technology Planning & Evaluation (IITP), **"A High-Performance Big-Hypergraph Mining Platform for Real-World Downstream Tasks,"** January 2023 – Present.
- Institute of Information & Communications Technology Planning & Evaluation (IITP), **"Development of Smart Media Analysis Techniques based on Implicit Feedback Information,"** April 2022 – August 2024.
- National Research Foundation of Korea (NRF), **"The Big-Data Real-Time System of Social Phenomena Monitoring and Social Simulation for Risk Management of a Hyper-Connected Society,"** March 2022 – February 2024.
- NAVER Company, **'네이버 AI 뉴스 추천 알고리즘의 사용자 만족도 및 공정성에 관한 연구,'** November 2020 – November 2021.
- National Research Foundation of Korean (NRF), **'데이터/기술 융합을 통한 네트워크 강화 및 소셜 네트워크 분석으로의 응용,'** March 2020 – February 2023.
- Hyundai Motor Company, "**VCRM Data Analysis for Connected Car Services,**" August 2021 – March 2023.
- Samsung Science & Technology Foundation, "**Compiler-based Runtime Optimization Framework for Accelerating Multiple Machine Learning Applications,**" June 2019 – May 2022.
- NAVER Company, **'네이버 추천 서비스를 위한 One-Class Collaborative Filtering 기술 개발 연구,'** August 2018 – August 2019.
- National Research Foundation of Korean (NRF), **'데이터/기술 융합을 통한 무관심 상품의 도출 및 이를 활용한 추천**

**시스템 기술 개발,**' March 2017 – February 2020.

## HONORS & AWARDS

- August 2024, **Outstanding Ph.D. Dissertation Award**, The Research Institute of Industrial Science, Hanyang University
- June 2024, **Invited Paper Presenter Selection**, Korea Computer Congress (KCC 2024)
- June 2023, **Invited Paper Presenter Selection**, Korea Computer Congress (KCC 2023)
- May 2023, **Excellent Paper Award**, Annual Spring Conference of KIPS (ASK 2023)
- May 2023, **Excellent Paper Award**, Annual Spring Conference of KIPS (ASK 2023)
- June 2021, **Participation Award**, Korea Computer Congress (KCC 2021)
- December 2019, **Best Paper Award**, Korea Software Congress (KSC 2019)

## PROFESSIONAL ACTIVITIES

- Program Committee Member: ACM SAC 2024, 2025 (SONAMA track), IEEE DSAA 2025
- External Reviewer: IEEE ICDM 2023, ACM WWW 2024, ACM SIGIR 2024, IEEE ICDM 2024