정다샘, Dasaem Jeong

https://jdasam.github.io/

Email : dasaemj@sogang.ac.kr

Office : +82 2-705-8381

Education

- **KAIST** — Dajeon, South Korea
  Ph.D. in Culture Technology (Advisor: Juhan Nam) — *Mar 2015 - Feb 2020*
  - **Dissertation**: Transcription and Modeling of Expressive Piano Performance Using Machine Learning
- **KAIST** — Dajeon, South Korea
  M.E. in Culture Technology (Advisor: Younghae Noh) — *Mar 2013 - Feb 2015*
  - **Thesis**: Music Visualization Using Flow Graph and its Effect on Listening to Classical Music
- **KAIST** — Dajeon, South Korea
  B.E. in Mechanical Engineering — *Feb 2008 - Feb 2013*
  - **Graduation Project**: An Automatic Pitch Correction Helper for a Trumpet

Experience

- **Sogang University** — Seoul, South Korea
  Assistant Professor at Art & Technology Department — *September 2021 - present*
- **SK Telecom** — Seoul, South Korea
  Research Scientist for Music AI in T-Brain X, T3K — *March 2020 - August 2021*
  - **Project**: Query-by-Humming, Automatic Music Transcription, Singing Voice Synthesis
- **KAIST - Music and Audio Computing Lab** — Daejeon, South Korea
  with Prof. Juhan Nam — *Sep. 2014 - Feb. 2020*
  - **Project**: Modeling Expressive Piano Performance with Deep Learning
    * A DNN-based system for modeling piano performance. Proposed an LSTM-based system with hierarchical attention networks and a variational autoencoder.
    * Music score as a graph. Proposed an Iterative Sequential Graph Network, which is a combination of Gated Graph Neural Network and hierarchical attention LSTM.
  - **Project**: Transcribing Dynamics of Piano Performance from an Audio Recording
    * NMF. Proposed a system using score-informed non-negative matrix factorization for estimating individual note intensities from an audio recording of piano performance.
    * Timbre-based approach. Proposed a system using a fully connected network that estimates a key velocity of given intensity-normalized note-spectrogram.
  - **Project**: Score-based Web Platform for Classical Music Listening
    * Audio-to-score alignment. Implemented a previously proposed method with MATLAB
    * A web interface with audio-synchronized music score. The interface includes rendering interactive music score, highlighting the currently-playing position in the score synchronized with the audio performance. Employed Verovio library and Web Audio API.
- **KAIST - Audio & Interactive Media Lab** — Daejeon, South Korea
  with Prof. Woon Seung Yeo — *Sep. 2013 - Feb. 2014*
  - **Project**: Developing Room Acoustic Simulation for Korean Traditional Music Ensemble
    * Recorded impulse response of the Pungnyu Sarangbang in National Gugak Center (국립국악원 풍류사랑방).
  - **Project**: Developing iPad Application for Korean Traditional Notation System (정간보)
    * Developed a module that converts input Korean notation to output Western notation.

Publications / Patents

- **Peer-reviewed Publication**:
  - Taegyun Kwon, Dasaem Jeong, and Juhan Nam, "End-to-End Polyphonic Piano Transcription Using Autoregressive Multi-Note-State Model", in *Proc. of the 21st International Society for Music Information Retrieval Conference (**ISMIR**)*, 2020
  - Dasaem Jeong, Taegyun Kwon, and Juhan Nam,**"Note Intensity Estimation of Piano Recordings Using Coarsely-aligned MIDI Score"**, in *Journal of Audio Engineering Society (**JAES**)*, 2020
  - Dasaem Jeong, Taegyun Kwon, Yoojin Kim, Kyogu Lee, and Juhan Nam, **"VirtuosoNet: A Hierarchical RNN-based System for Modeling Expressive Piano Performance"**, in *Proc. International Society for Music Information Retrieval (**ISMIR**)*, 2019.
  - Dasaem Jeong, Taegyun Kwon, Yoojin Kim, and Juhan Nam, **"Graph Neural Network for Music Score Data and Modeling Expressive Piano Performance"**, in *Proc. of of the 36th International Conference on Machine Learning (**ICML**)*, 2019.
  - Dasaem Jeong, Taegyun Kwon, and Juhan Nam, "A Timbre-based Approach to Estimate Key Velocity from Polyphonic Piano Recordings", in *Proc. International Society for Music Information Retrieval (**ISMIR**)*, 2018.
  - Taegyun Kwon, Dasaem Jeong, and Juhan Nam, "Audio-to-Score Alignment Of Piano Music Using RNN-based Automatic Music Transcription ", in *Proc. of the 14th Sound and Music Computing Conference (SMC)*, 2017.
  - Dasaem Jeong, and Juhan Nam, "Note Intensity Estimation of Piano Recordings by Score-informed NMF", in *Proc. of the Audio Engineering Society Conference on Semantic Audio (AES)*, 2017.
  - Dasaem Jeong, and Juhan Nam, "Visualizing Music in its Entirety using Acoustic Features: Music Flowgram", in *Proc. of the 2nd International Conference on Technologies for Music Notation and Representation (TENOR)*, 2016.
- **Workshop Papers**:
  - Dasaem Jeong, Seongheon Doh and Taegyun Kwon "TräumerAI: Dreaming Music with StyleGAN", in *4th Workshop on Machine Learning for Creativity and Design, Neural Information Processing Systems (NeurIPS)*, 2020.
  - Dasaem Jeong, "Real-time Automatic Piano Transcription System", in *Late Breaking/Demo in the 21st International Society for Musical Information Retrieval Conference (ISMIR)*, 2020.
  - Dasaem Jeong, Taegyun Kwon, Yoojin Kim, and Juhan Nam, "Score and Performance Features for Rendering Expressive Music Performances", in *Proc. of the 7th Music Encoding Conference*, 2019.
  - Dasaem Jeong, Taegyun Kwon, and Juhan Nam, "VirtuosoNet: A Hierarchical Attention RNN for Generating Expressive Piano Performance from Music Score", in *2nd Workshop on Machine Learning for Creativity and Design, Neural Information Processing Systems (NeurIPS)*, 2018.
  - Dasaem Jeong, Taegyun Kwon, Chaelin Park, and Juhan Nam, "PerformScore: Toward Performance Visualization With the Score on the Web Browser", in *Late Breaking/Demo in the 18th International Society for Musical Information Retrieval Conference (ISMIR)*, 2017.
- **Publications in Musicology, Peer-reviewed on Abstract**:
  - Dasaem Jeong, and Juhan Nam, "How the Rhythm Is Actually Performed in the First Movement of the Beethoven's Seventh Symphony", in *Proc. of the 10th International Conference of Students of Systematic Musicology (SysMus)*, 2017.
  - Saebyul Park, Seunghun Kim, Dasaem Jeong, Juhan Nam and Jeounghoon Kim, "Melodic and Harmonic Similarity for Music Plagiarism: Comparison between computational analysis and perceptual evaluation", in *Proc. of the Society for Music Perception and Cognition (SMPC)*, 2015.
  - Dasaem Jeong, Younghae Noh, "Music Visualization Using Volume Graph and its Effect on Classical Music Listening", in *Proc. of the 9th Conference on Interdisciplinary Musicology (CIM)*, 2014.
  - Dasaem Jeong, "Correlation between Music, Stage Direction, and Technology in Wagner's Ring Cycle (바그너의 니벨룽의 반지에서 살펴본 음악과 연출과 기술의 상관관계)", in *Proc. of the 69th Symposium of the Musicological Society of Korea(한국서양음악학회 학술대회)*, 2013.
- **Domestic Patent (in Korea)**:
  - Juhan Nam, Taegyun Kwon, and Dasaem Jeong, "Method and System for Audio and Score Alignment of Music Using Neural Network-Based Automatic Music Transcription (심층 인공신경망 기반 자동 악보 채보를 이용한 연주 및 악보 정렬 방법 및 시스템)", Patent No. 10-1939001 (2019.01.09)
  - Youngjin Park, Sangmin Baek, Dasaem Jeong, Minju Kang, Chanho Park, Sangeon Lee, and Jeongin Jang, "Valve Opening and Shutting Type Brass Instrument Automatic Correction Helper (밸브 개폐식 금관악기 자동 음정 보정 장치)", Patent No. 10-1392182 (2014.04.29)

Teaching Experience

- **TA of "Music and Audio Computing " & "Sound Technology For Multimedia"** KAIST
  Courses by Prof. Juhan Nam (CTP431) *Spring, Fall 2015*
- **Instructor of Humanity/Leadership III "Understanding Operas"** KAIST
  An HS10.174 course for freshmen students with a student instructor. *Spring 2012 - Spring 2015, Spring 2016*
  - The course consisted of two hours per lecture and thirteen lectures per semester (total eight semesters). Gave lectures about western opera including topics such as opera singing, stage directions, and structure of music and drama.
- **TA of "Understanding Music and Music History"** KAIST
  Lecture by Prof. Younghhae Noh *Fall 2012, Fall 2013 - Fall 2014*
  - Gave summary lectures before mid-term, special lectures on various topics such as "Wagner's Ring cycle", "Interpretation of music score", and "Operas for modern listeners", attended and gave advice on individual team meetings for student presentations.
- **Instructor of Humanity/Leadership III "Listening to Classical Music"** KAIST
  An HS10.174 course for freshmen students with a student instructor. *Spring 2009 - Spring 2011*
  - The course consisted of two hours per lecture and thirteen lectures per semester (total five semesters). Gave lectures about classical music including topics from music history, orchestrations, and music aesthetics.

Awards

- **Global Leadership Award: Creativity** KAIST
  A presidential award given to a student who demonstrated the school's core value, creativity. *Jul. 31, 2020*
- **Best Instructor Award for Humanity/Leadership III** KAIST
  Understanding Opera in Fall 2013

Programming Skills

- **Languages**: Python, JavaScript, MATLAB, HTML/CSS **Technologies/Library**: Git, PyTorch

Talks

- **Inha University AI Convergence Research Center Invited Seminar** Inha University
  "Can AI Understand Music?" *Oct. 16, 2021*
- **Huawei Tokyo Research Center Invited Seminar** Huawei Japan
  "Modeling Expressive Performance with Deep Learning" *Oct. 29, 2020*
- **63rd Seminar of Korean Society for Music Perception and Cognition** KSMPC
  "Modeling Expressive Piano Performance Using a Deep Neural Network" *Nov. 30, 2019*
- **Seoul Copyright Forum 2019** Korea Copyright Commission
  "Music Performance of A.I." *Nov. 20, 2019*
- **Music and Audio Workshop** KAIST & SNU
  'Generating Piano Performance from Music Score" *Feb. 22, 2019*
- **Guest Lecture on Wagner's Ring** Korean Wagner Society
  "Technology and Stage direction of Wagner's Ring" *Oct. 28, 2013*

Concerts / Exhibition

- **KAIST 50th Anniversary Ceremony Opening Concert** KAIST
  Beethoven's Symphony No. 5 for two pianos, performed by VirtuosoNet and Jonghwa Park *Feb. 2021*
- **Artificial Humanity** Seoul Art Space Mullae
  Premiere of contemporary music by Hana Ryu, performed by VirtuosoNet *Jan. 2021*

- **AI:UM 2020 Online Booth** 2020 AI Week festival
  AI Piano with Automatic Music Transcription in a virtual exhibition by AI Friends, HelloDD *Sep. 2020*

- **Ways of Seeing** Dajeon Museum of Art
  Deep Space Music - an AI Pianist (VirtuosoNet) with Media Art by Nos Visuals *Nov. 2019*

Activities

- Playing cello and conducting orchestra, Learning foreign languages (German, Italian, French, and Russian).