

Fadi Al-Ghawanmeh
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U.S. work authorization beginning May 2023

EDUCATION

Spring 2024	Joint-Ph.D. fulfilling doctoral requirements in Computer Science (University of Lorraine) and Music Technology (University of Oslo) <i>Dissertation</i> : “NLP-Based Automatic Instrumental Improvisation with Control Allowing a Real-Time and Customized Influence on Individuals”
2013	M.A. in Music Technology, New York University <i>Thesis</i> : “Automatic Accompaniment to Arab Vocal Improvisation, Mawwal”
2010	B.A. in Music, University of Jordan
2008	B.A. in Computer Engineering, University of Jordan

ACTIVE DOMAINS OF RESEARCH

Natural language processing (NLP) applied to music; digital signal processing (DSP); machine learning, machine virtuosity, and their human perception; technology and music education

ACADEMIC EMPLOYMENT

2022 – present	Attaché Temporaire d’Enseignement et de Recherche [Temporary Research and Teaching Fellow], Institute of Digital Sciences, Management, and Cognition (IDMC), University of Lorraine
2013 – 2020	Faculty Member (tenured September 2020), Music Department, University of Jordan
2016 – 2020	Adjunct Lecturer, American University of Madaba, Jordan
2019	Adjunct Lecturer, German Jordanian University

GRANTS

2018 – 2023	<i>Licence- Technologie de la Musique</i> Manager. Capacity-building initiative to establish the infrastructure for an undergraduate concentration in Music Technology at the University of Jordan. The project performed in collaboration with Lorraine Research
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Laboratory in Computer Science and its Applications (LORIA). The Agence Universitaire de la Francophonie (AUF) contributed 12,000 euro.

- 2016 – 2022 *TRAM: Translating Arab Music*
Manager and research team co-leader. Research initiative for using machine translation methods to propose an automatic accompaniment to Arab vocal improvisation (mawwāl). 20,000 euro funded by the AUF.
- 2014 – 2015 *Designing Compositional Algorithms for an Improved Automatic Accompaniment to Arab Vocal Improvisation “Mawwāl”*
Project manager and research team leader. Fund totaling \$21,000 from the University of Jordan and the Arab Fund for Arts and Culture (AFAC).
- 2008 – 2009 *Digital Melody Indexing of Jordanian Musical Libraries*
Project manager and research team co-leader. Funds totaling \$40,000 from the European Commission and the Shoman Foundation.

AWARDS AND SCHOLARSHIPS

- 2018 Full Scholarship from the University of Jordan to pursue Ph.D. studies at the University of Oslo and the University of Lorraine
- 2017 Award for best paper at the International Conference on Natural Language, Signal and Speech Processing (ICNLSSP), Higher Institute of Engineering and Business, Casablanca, Morocco
- 2016 Erasmus Mundus Staff-Exchange Scholarship. One month. Lorraine Research Laboratory in Computer Science and Its Applications (France).
- 2015 Grant from the University of Jordan for 4-month scientific visit to Lorraine Research Laboratory in Computer Science and its Applications (France).
- 2013 Erasmus Mundus Staff-Exchange Full Scholarship. University of Bologna, Italy. October.
- 2011 Full Scholarship from the University of Jordan to pursue M.A. in Music Technology at New York University
- 2009 Erasmus Mundus Undergraduate Exchange. Full scholarship to Berlin University of Technology/Audio Communication Department (nine months).
- 2008 First chair prize. National Technology Parade, E-Learning theme. Jordan.
- 2008 Third chair prize. The Contest of the Eleventh Conference of Students’ Creativity, Association of Arab Universities. Latakia, Syria.

2006	Partial scholarship. Summer school at Munich University of Technology.
2004	First chair prize. Youth Creativity Contest for Music. The Ministry of Culture, Jordan.
2003	Third chair prize. Musical Contest of the Ministry of Education, and first chair prize for Amman Governorate.

SERVICE

2021 – 2024	Liaison Officer to Jordan, International Council of Traditional Music
2022	Evaluator for the International Computer Music Conference (ML-based composition topic)
2019 – 2020	Representative of the School of Arts and Design, University Council, University of Jordan
2019	Judging Panelist for the Division of Music, Film, and Theatre, Global Undergraduate Awards, Ireland

ADDITIONAL TRAINING

2014	Advanced Statistics for Scientific Research, University of Jordan
2009	Digital Musical Signal Analysis, Berlin University of Technology, Germany
2008	Digital Economy, CRM, and Individualism, Bogazici University, Turkey
2006	Programming System on Chip (PSoC)/IEEE
2006	IT for Sustainable Development of Cultural Heritage, Munich University of Technology, Germany

TEACHING EXPERIENCE

Institute of Digital Sciences, Management, and Cognition, University of Lorraine, France

Instructor of Record

Unified Modeling Language (M.S.-level; Fall 2022)

Course Assistant

Algorithms and Programming I (undergraduate-level; Fall 2022)

Algorithms and Programming III (undergraduate-level; Spring 2023)

Department of Music, University of Jordan

Instructor of Record (2013–2020)

Music and Technology I (annually)

Music and Technology II (annually)

Music Appreciation (annually)

Introduction to Music (annually)

Careers in Music

Organology

Principles of Music Education

Methods of Music Education

Nay Performance

Faculty of Design and Architecture, American University of Madaba,

Instructor of Record (2016–2020)

Appreciation of Music

Introduction to Musicology

School of Architecture and Built Environment, German Jordanian University

Instructor of Record (2019)

Composition Techniques (for multimedia)

LANGUAGES

Arabic: native fluency

English: fluent

French: very good

German: beginner

FREQUENTLY USED PROGRAMMING LANGUAGES

Java, MATLAB, Python, Max/MSP, C, Csound

PUBLICATIONS

Journal Articles

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| 2018 | Al-Ghawanmeh F., & Smaïli K. “Statistical Machine Translation from Arab Vocal Improvisation to Instrumental Melodic Accompaniment,” <i>Journal of International Science and General Applications</i> 1 (1): 11-17. Casablanca (Morocco): ISGA. |
| 2016 | Al-Ghawanmeh F., Al-Ghawanmeh M., and Abed M. “Real-Time Maqam Estimation Model in Max/MSP Configured for the Nay,” <i>International Journal of Communications, Network and System Sciences</i> 9(2): 39-52. Delaware (USA): |

Scientific Research Publishing.

- 2015 **Al-Ghawanmeh F.**, & Shannak Z. “Automatic Accompaniment to Arab Vocal Improvisation: From the Technical to the Commercial Perspectives,” *Journal of Software Engineering and Applications* 8(1): 16-25. Delaware (USA): Scientific Research Publishing.
- 2014 **Al-Ghawanmeh, F.**, Haddad, R., & Al-Ghawanmeh, M. (2014). “Proposing a Process for Using Music Analysis Software to Improve Teaching Authentic Arab Singing and Ornamenting,” *International Journal of Humanities and Social Science* 4(6). Los Angeles (USA): Centre for Promoting Ideas.
- 2014 Tayseer, A., Haddad, R., Sukkarieh, H., and **Al-Ghawanmeh, F.** “Modes (Maqamat) in Contemporary Arab Songs,” *Dirasat Journal of Human Sciences*, 41(1): 598-611. Amman (Jordan): University of Jordan. (In Arabic)
- 2010 Haddad, R., **Al-Ghawanmeh, F.**, and Al-Ghawanmeh, M. “Educational Tools Based on MIR System for Arabian Woodwinds,” *Journal of Music, Technology and Education* 3(1). Bristol (UK): Intellect.
- 2010 Al-Tae, M., and **Al-Ghawanmeh, F.** “Analysis and Features Recognition of Arabian Flute (Nay) Musical Tones,” *Jordan Journal of the Arts* 3(2): 95-110. Irbid (Jordan): Yarmouk University. (In Arabic)
- 2009 Al-Tae, M., Al-Ghawanmeh, M., **Al-Ghawanmeh F.**, and Omar, B. “Analysis and Pattern Recognition of Arabian Woodwind Musical Tones Applied to Query-By-Playing Information Retrieval,” *Lecture Notes in Engineering and Computer Science* 2176(1). Hong Kong.

Published Conference Papers

- 2023 **Al-Ghawanmeh, F.**, Jensenius A., and Smaïli K. “How can machine translation help generate Arab melodic improvisation?” Accepted for publication in the proceedings of the Conference of the European Association for Machine Translation, Tampere, Finland. June 12–15.
- 2021 **Al-Ghawanmeh F.**, Scott M., Menacer M., and Smaïli K. “Predicting and Critiquing Machine Virtuosity: Mawwal Accompaniment as Case Study.” Proceedings of the International Computer Music Conference, Santiago, Chile.
- 2019 **Al-Ghawanmeh F.**, Smaïli K., and Menacer M. “Accompaniment to Arab Vocal Improvisation Based on Statistical Machine Translation: Objective and Subjective Evaluation.” Conference on Interdisciplinary Musicology - CIM 19, Graz, Austria, Sept. 26-28.

- 2017 **Al-Ghawanmeh F.**, and Smaïli K. “Statistical Machine Translation from Arab Vocal Improvisation to Instrumental Melodic Accompaniment.” Proceedings of the International Conference on Natural language, Signal and Speech Processing, ICNLSSP. Higher Institute of Engineering and Business, Casablanca, Morocco December 5-6. (Best paper award.)
- 2017 **Al-Ghawanmeh, F.**, Al-Ghawanmeh, M., Haddad, R., and Nsairat N. “Adhan as an Improvisation Material toward Better Educational Process: Bridging the gap between educators, practitioners and students from both Sharia and music backgrounds.” Abstract in the International Conference on Musical Cultures, University of Hull, UK, April 3-5.
- 2014 **Al-Ghawanmeh, F.**, Al-Ghawanmeh, M., & Obeidat, N. (2014). “Toward an Improved Automatic Melodic Accompaniment to Arab Vocal Improvisation, Mawwāl,” In the Proceedings of the 9th Conference on Interdisciplinary Musicology – CIM14, Berlin, 4-6 December.
- 2011 **Al-Ghawanmeh, F.**, Jafar, I., Al-Tae, M., Al-Ghawanmeh, M., and Muhsin, Z. “Development of Improved Automatic Music Transcription System for the Arabian Flute (Nay).” In the Proceedings of the 8th International Multi-Conference on Systems, Signals and Devices (SSD-11). Sousse, Tunisia, March 22-25.
- 2009 **Al-Ghawanmeh, F.**, AL-Ghawanmeh, M., and Haddad, R. “Appliance of Music Information Retrieval System for Arabian Woodwinds in E-Learning and Music Education.” In the Proceedings of the International Computer Music Conference, ICMC09, Montréal 16-21 August.
- 2009 Al-Tae, M., Al-Ghawanmeh, M., **Al-Ghawanmeh F.**, and Omar, B. “Analysis and Pattern Recognition of Woodwind Musical Tones Applied to Query-By-Playing Information Retrieval.” In the Proceedings of the International Conference of Computer Science and Engineering, ICCSE_59, World Congress on Engineering, WCE. London, U.K., 1-3 July.
- 2008 Al-Tae, M., Al-Rawi, M., and **Al-Ghawanmeh, F.** “Time-Frequency Analysis of the Arabian Flute (Nay) Tone Applied to Automatic Music Transcription.” In the Proceedings of the 6th ACS/IEEE International Conference on Computer Systems and Applications (AICCSA-08), Doha, Qatar, March 31 - April 4.

CONFERENCE PRESENTATIONS (titles under Publications)

- 2023 The Conference of the European Association for Machine Translation, Tampere, Finland. June 12-15.
- 2021 The International Computer Music Conference, (Online). July 25-31.

- 2019 The Conference on Interdisciplinary Musicology - CIM 19, Graz, Austria, Sept. 26-28.
- 2017 The International Conference on Natural language, Signal and Speech Processing, ICNLSSP. Higher Institute of Engineering and Business, Casablanca, Morocco. December 5-6.
- 2017 The International Conference on Musical Cultures, University of Hull, UK. April 3-5.
- 2014 The 9th Conference on Interdisciplinary Musicology: CIM14, Berlin. December 4-6.
- 2009 The 2009 International Computer Music Conference, Montréal. August 16-21.
- 2009 World Congress on Engineering, WCE 2009. London, U.K. July 1-3.
- 2008 The Eleventh Conference of Students Creativity. Association of Arab Universities. Latakia, Syria.

ART WORKS

- Present Arab Takht recordings and recordings of automatically accompanied vocal improvisations available here: <http://www.mawaweel.com/AudioRecording/>

- 2018 Al-Ghawanmeh F., and Smaili K. Andalusian Fragrance (SMT-Based Musical Accompaniment). *NIPS (NeurIPS) 2018 Creativity Art Gallery, Machine Learning for Creativity and Design Workshop*, Montreal, Canada.

Machine learning-based automatic instrumental response to vocally improvised (mawwāl) narrative poetry. The work features the new AI-based mawaweel music accompaniment application. Throughout this artwork, the improviser Muhannad Alkhateeb used elaborate expressiveness, maqam modulation and choice of register all to convey the deep and diverse feelings expressed in the poetry, such as: passion, doubt, anger, sorrow and hope. The computer successfully stood as a peer while translating the creative vocal sentences. As this was a studio recording, we had the privilege of recording several takes and selecting the best ones from two perspectives: vocal and instrumental. We then applied slight reverb, EQ, and compression. However, the model is robust for live performances.

Available here:
<http://www.aiartonline.com/music/fadi-al-ghawanmeh-and-kamel-smaili/>

- 2012 *Ryan the New Yorker*

Un-tuned natural sounds used in a modal structure and sequenced automatically. The audio samples used in this composition are vocal expressions (laughing, breathing, crying, etc.) of my son Ryan when he was 2 months old. The modal structure here is that of the Mawaweel accompaniment system (presented in my master thesis). This music is the automatic instrumental accompaniment to a

given vocal improvisation, but with muting the vocal and substituting instrumental samples by the un-tuned natural samples.

Available here:

http://mawaweel.com/Portfolio_Fadi_AlGhawanmeh/Ryan%20Piece

2012

30 Seconds

Piece for nay and piano in twelve-tone serialism.

Available here:

http://mawaweel.com/Portfolio_Fadi_AlGhawanmeh/30%20seconds