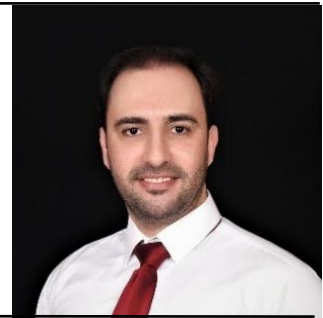


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**EDUCATION****Ph.D. in Civil Engineering, December 2017**

Michigan State University, Michigan, USA

Major: Structural Engineering and Construction Materials

Dissertation: "Mechanochemical Synthesis of Sustainable Hydraulic Cements"

**M.Sc. in Civil Engineering, January 2013**

Jordan University of Science and Technology (JUST), Irbid, Jordan

Major: Structural Engineering and Construction Materials

Thesis: "Assessment of Pozzolans from Jordanian Badia for Potential Use in Producing Green Construction Materials"

**B.Sc. in Civil Engineering, January 2010**

Jordan University of Science and Technology (JUST), Irbid, Jordan

Major: Structural Engineering

Graduation project: Design of a residential building contains 5 floors (Total area of 3000 m<sup>2</sup>), and an underground water tank of 200 m<sup>3</sup> total volume.

**PROFESSIONAL EXPERIENCE (ACADEMIA)**

- Assistant Professor, Department of Civil Engineering, Yarmouk University, Irbid, Jordan. January 2018-present.
- Engineering Assistant Dean for Accreditation and Quality Assurance. Yarmouk University, Irbid, Jordan. December 2018-present.
- Teacher Assistant, Department of Civil and Environmental Engineering, Michigan State University. 2014-2017.
- Part-time lecturer, Department of Civil Engineering, Jordan University of Science and Technology. 2013-2014.
- Teacher Assistant, Department of Civil Engineering, Jordan University of Science and Technology. 2010-2013.

## PUBLICATIONS

1. **F. Matalkah**, P. Soroushian, SU. Abideen, A. Peyvandi. Use of non-wood biomass combustion ash in development of Alkali Aluminosilicate-based hydraulic cement concrete. *"Construction and Building Materials"* 121 (2016), 491-500.
2. **F. Matalkah**, P. Soroushian, A. Balchandra, A. Peyvandi. Characterization of Alkali-Activated Nonwood Biomass Ash-Based Geopolymer Concrete." *Journal of Materials in Civil Engineering* (2016): 04016270.
3. **F. Matalkah**, L. Xu, W. Wu, P. Soroushian. Mechanochemical synthesis of one-part alkali aluminosilicate hydraulic cement. *"Materials and Structures"* 50.1 (2017): 97.
4. **F. Matalkah**, P. Soroushian, R. Weerasiri, A. Peyvandi. Development of Indigenous Binders as Construction Materials. *"Proceedings of the Institution of Civil Engineers -Construction Materials"* 171, (2017): 1-10.
5. **F. Matalkah**, H. Bharadwaj, A. Balachandra, P. Soroushian. Development and Characterization of Gypsum-Based Binder. *"European Journal of Advances in Engineering and Technology"* 4:3 (2017), 153-157.
6. **F. Matalkah**, H. Bharadwaj, P. Soroushian. W. Wu, A. Almalkawi, A. Balachandra, A. Peyvandi. Development of sandwich composites for building construction with locally available materials. *"Construction and Building Materials"* 147 C (2017), 380-387.
7. **F. Matalkah**, H. Bharadwaj, A. Balachandra, P. Soroushian. Aerated Concrete Produced Using Locally Available Raw Materials ". *Civil Engineering Journal* 3:4 (2017), 214-220.
8. I. Harsini, **F. Matalkah**, P. Soroushian, A. Balachandra. Robust, Carbon Nanotube/Polymer Nano-Layered Composites with Enhanced Ductility and Strength. *"Journal of Nanomaterials & Molecular Nanotechnology"* 3: 6 (2017), 1-6.
9. **F. Matalkah**, A. Darsanasiri, A. Balachandra, P. Soroushian. Alkali-Activation of Non-Wood Biomass Ash: Effects of Ash Characteristics on Concrete Performance. *"Civil Engineering Journal"* 3: 5 (2017), 365-371.
10. Y. Chen, **F. Matalkah**, Y. Yu, W. Rankothge, A. Balachandra, P. Soroushian. Experimental Investigations of Durability and Volume Stability of Ultra-High-Performance Concrete. *"Advances in Materials Science and Applications"* 1: 6 (2017), 1-8.
11. Y. Chen, **F. Matalkah**, W. Rankothge, A. Balachandra, P. Soroushian. Improvement of the surface quality and aesthetics of ultra-high-performance concrete. *"Proceedings of the Institution of Civil Engineers-Construction Materials"* (2017): 1-10.
12. W. Wu, **F. Matalkah**, P. Soroushian, A. Almalkawi, X. Wang, L. Xu. Influence of admixtures on rheological properties and heat of hydration of alkali aluminosilicate cement. *"Advances in Cement Research"* 9:29 (2017),397-403.
13. L. Xu, **F. Matalkah**, P. Soroushian, Y. Chen, N. Darsana, S. Hamadneh, A. Balachandra, W. Wu. Effects of Citric Acid on the Rheology, Hydration Kinetics and Strength of Fly Ash-Based Geopolymer Paste. *"Advances in Cements Research"* 30:2 (2017):1-8.
14. A. Balachandra, K. Zhu, S. Ramli, P. Soroushian, **F. Matalkah**. Development of Refined Chemistries and Processing Methods for Integration of Carbon Dioxide into a Hydraulic Binder for Effective Heavy Metal Immobilization. *"Juniper Online Journal Material Science "* 2:4 (2017), 1-7.

15. Y. Chen, **F. Matalkah**, W. Rankothge, A. Balachandra, P. Soroushian. Dispersion of Fibers in Ultra-High-Performance Concrete. *"Concrete International"* (2017), 12.
16. X. Wang, K.Zhu, S. Ramli, L Xu, **F. Matalkah**, P Soroushian, A. Balachandra. Conversion of Landfilled Ash into Hydraulic Cements under Different Environments. *"Advances in Recycling and Waste Management"* 2:4 (2017), 1-7.
17. **F. Matalkah** and P. Soroushian. Synthesis and Characterization of Alkali Aluminosilicate Hydraulic Cement that Meets Standard Requirements for General Use. *"Construction and Building Materials"* 158 (2018), 42-49.
18. X. Wang, **F. Matalkah**, N.Abdol, S. Ramli, P. Soroushian, A.M Balachandra. Effects of the Duration of Landfill Disposal on the Physico-Chemical, Mineralogical and Toxicity Characteristics of Coal Ash *"International Journal of Coal Preparation and Utilization"* (2018). 1-16
19. K. Zhu, **F. Matalkah**, S. Ramli, N. Abdol, B. Durkin, P. Soroushian, A. Balachandra. Carbon Dioxide Use in Beneficiation of Landfilled Coal Ash for Hazardous Waste Immobilization. *"Journal of Environmental Chemical Engineering"* 6 (2), (2018).2055-2062
20. A. Darsana, **F. Matalkah**, S. Ramli, K. Al-jaloudi, A. Balachandra, P. Soroushian. Ternary Alkali Aluminosilicate Cement Based on Rice Husk Ash, Slag and Coal Fly Ash. *"Journal of Building Engineering"*. 19, (2018). 36-41
21. **F. Matalkah** and P. Soroushian. Carbon Dioxide Integration into Alkali Aluminosilicate Cement Particles for Achievement of Improved Properties. *"Journal of Cleaner Production"*. 196 (2018) 1478-1485.
22. **F. Matalkah** and P. Soroushian. A Step Toward Practical Geopolymer Concrete: Laboratory investigations and a field demonstration show promise. *"Concrete International"*. 40. 8 (2018) 39-43.
23. **F. Matalkah**, T. Salem, P. Soroushian. Acid resistance and Corrosion Potential of Concrete Prepared Using Alkali Aluminosilicate Cement. *"Journal of Building Engineering"*. 20 (2018). 705-711.
24. **F. Matalkah** and P. Soroushian. Freeze Thaw and Deicer Salt Scaling Resistance of Concrete Prepared with Alkali Aluminosilicate Cement. *"Construction and Building Materials"*.163 (2018), 200-213.
25. A. Ababneh and **F. Matalkah**. Potential Use of Jordanian Volcanic Tuffs as Supplementary Cementitious Materials. *"Case Studies in Construction Materials"*8 (2018). 193-202.
26. **F. Matalkah**, M. Mahmood, N. Darsana, N. Abdol, P. Soroushian, A. Balachandra. High-Recycled-Content Hydraulic Cements of Alternative Chemistry for Concrete Production. *"International Journal of Sustainable Engineering"*. (2018). 1-10.
27. Y. Chen, **F. Matalkah**, P. Soroushian, L. Xu, R. Weerasiri, A. Balachandra. Optimization of Ultra-High-Performance Concrete, Quantification of Characteristic Features. *"Cogent Engineering"* 6 (1) (2019), 1-12.
28. **F. Matalkah**, T. Salem, Mamoon Shaafaey, P. Soroushian. Drying shrinkage of alkali activated binders cured at room temperature. *"Construction and Building Engineering"*. 201 (2019). 563-670.
29. W. Wu, **F. Matalkah**, N. Darsanasiri, P. Soroushian. Fluidized Bed Combustion Coal Fly Ash: Comparative Evaluation for Potential Use in Alkali Activated Binders. *"International Journal of Coal Preparation and Utilization"* (2019). 1-16.
30. Y. Chen, **F. Matalkah**, A. Balachandra, P. Soroushian. Ultra-High-Performance Concrete: Development of On-Site Fresh Mix Rheology Test Methods. *"Journal of Advanced Research in Applied Mechanics"* (2019). 55, 1-11.

31. **F. Matalkah**, Y. Jaradat, P. Soroushian. Plastic Shrinkage Cracking and Bleeding of Concrete Prepared with Alkali Activated Concrete. *“Heliyon”* (2019). 5, 4, 1-16.
32. **F. Matalkah** and P. Soroushian. Shelf Life of Alkali Activated Cement: Effects of Storage Condition and Duration. *“Construction and Building Materials”* (2019).222, 664-672.
33. **F. Matalkah**, Y. Jaradat, W. Rankothge, P. Soroushian. Effect of Additives on the CO<sub>2</sub> Uptake and Compressive Strength of Dry-Cast Concrete. *“Magazine of Concrete Research”* (2019).

## CONFERENCES AND PRESENTATIONS

1. **F. Matalkah** and P. Soroushian. “Geopolymer Concrete: A Sustainable Alternative to Portland Cement Concrete”. *Engineering Graduate Research Symposium*, East Lansing, Michigan, USA (2015).
2. **F. Matalkah** and P. Soroushian. “Value-Added Use of Carbon Dioxide for Production of New Hydraulic Cements Chemistry”. *Engineering Graduate Research Symposium*, East Lansing, Michigan, USA (2016).
3. **F. Matalkah** and Y. Jaradat. “Use of Jordanian Olive Waste Ash as a Raw Material for Geopolymer Concrete”. *Hijawi Faculty for Engineering Technology Scientific Day*, Irbid, Jordan (2019).
4. **F. Matalkah**, R. Aqel, A. Ababneh. “Enhancement of the Mechanical Properties of Kaolin Geopolymer Using Sodium Hydroxide and Calcium Oxide”. *International Conference on Optimization-Driven Architectural Design (OPTARCH2019)* Amman, Jordan (2019).

## AWARDS AND SCHOLARSHIPS

- Full scholarship (\$170,000) from Yarmouk University covering studies towards the Ph.D. degree in Civil Engineering at Michigan State University (2014).
- Be Spartan Green proposal grant (\$5,000) from Michigan State University - Sustainability Department (2016).
- Graduate School Dissertation Completion Fellowship (\$5,000) from Michigan State University – Collage of Engineering (2017).

## GRANTS

- Scientific Research and Graduate Studies Deanship at Yarmouk University. “Use of Jordanian Olive Waste Ash as a Raw Material for Geopolymer Concrete” Grant number 53-2018 (\$20,700).
- Deanship Research at Jordan University of Science and Technology. “Development of Alkali-Activated Cement based on Jordanian Kaolin. Grant Number 68-2019 (\$9,460).

## SUPERVISED GRADUATE STUDENTS

1. **Ruba Aqel** (2017-2019) Thesis Title: Development of Alkali-Activated Cement Based on Jordanian kaolin.
2. **Bisher Matalka** (2018-2020) Thesis Title: Assessment of Jordanian Kaolin Collected from Several Deposits in Southern Jordan for Potential Use in Alkali Activated Concrete.

## CITIFICATES AND WORKSHOPS

- Certificate of “Entering Mentoring Training” provided by the National Research Mentor Network (Michigan 2017).
- 3 Days Workshop on “How to Qualify for ABET Accreditation” given by the Association of Arab Universities (Amman 2019).

## JOURNALS REVIEW MEMBERSHIP

- Construction and Building Materials Journal
- Waste and Biomass Valorization Journal
- Journal of Civil & Environmental Engineering
- Acta Astronautica Journal

## RESEARCH ACTIVITIES

### Research Experience

- Scientific Researcher at Metna Co. Lansing, Michigan, USA. 2014-2017.
- Research Assistant, Department of Civil Engineering, Jordan University of Science and Technology, Jordan. 2013-2014.

### Projects

- Development of scalable, economical and convenient methods of delivering carbon dioxide to cement, and to tailor the chemistry of cement to make beneficial use of large carbon dioxide volumes towards achieving enhanced performance, economic, sustainability and energy-efficiency attributes. **(US Department of Energy)**.
- Development of catalytic routes to processing the solid residues and the carbon dioxide content of the emissions of clean coal combustion into a high-performance and sustainable class of hydraulic cement. **(US Department of Energy)**.
- Development of mix design procedures and production methods for reliable construction of large ultra-high-performance concrete (UHPC) structures in Air Force test facilities using locally available materials and concrete-making facilities. Compressive strengths in excess of 200 MPa (30 ksi) are targeted. **(US Army)**.
- Refinement of the concrete chemistries where the alkali and silica contents of non-wood biomass ash are supplemented by the addition of alumina-rich constituents to produce a balanced chemistry for production of ‘non-wood biomass ash-based hydraulic cement. **(US Department of Agriculture)**.

- Development of a robust class of hydraulic cement and concrete materials which, when compared with existing rapid hardening hydraulic cement, asphalt and polymer concrete materials used in pavement top layers, provide distinctly high rates of strength development for rapid opening of the pavement to heavy traffic. **(US Department of Defense)**.
- Development and experimentally verifying a laboratory-scale version of the process for value-added use of carbon dioxide and impounded/landfilled coal ash towards production of a new inorganic binder with distinct stabilization/solidification qualities associated with zeolitization and carbonation phenomena. **(US Environmental Protection Agency)**
- Development of building systems which employ locally available resources to efficiently meet stringent structural (load bearing), protective (projectile penetration resistance and energy absorption), moisture barrier, weathering resistance, thermal insulation, fire resistance, health and sustainability requirements. **(US Army)**.
- I have also worked as a research assistant in the department of civil engineering at JUST in two research projects related to the civil engineering applications of nanotechnology:
  - ✓ Influent of Nanofilaments on the Mechanical Properties, Workability, and Durability of Cement- Based Materials.
  - ✓ Strengthening, Repair, and Rehabilitation of New and Existing Reinforced Concrete Structures Using Nanocomposites.

## EXTRACURRICULAR ACTIVITIES

### **Arab Cultural Society; Treasurer: April 2015-May 2016, Vice President August 2016 – May 2017.**

- Oversaw executive board and member meetings; lead executive board in promoting cultural awareness on campus and in community.
- Planned, budgeted, and managed various events throughout the year, including speaker series, club socials, receptions, dinners, and more.
- Attended on-campus governance meetings (Associated Students of MSU, Residence Halls Association, International Student Association) and other meetings to keep group involved with on-campus community.

### **Advisor of the American Concrete Institute (ACI Yarmouk University Student Chapter) January 2019 – Present**

- Organize events/workshops to provide technical education, scientific investigation and research, and development of standards for design and construction incorporating concrete and related materials.
- Host/attend ACI Conventions, sponsor ACI Certification sessions, educational seminars, project award programs, and social events with the goal of advancing concrete knowledge and creating a local concrete community.

## MEMBERSHIPS

- Member of the American Concrete Institute (ACI)
- Member of the American Society of Civil Engineers (ASCE)
- Member of the Institution of Civil Engineers (ICE)

## INDUSTRIAL EXPERIENCE

- Worked as a site engineer at Eng. FATHI FARAJALLAH for building & contracting Est. (Few projects in Irbid), April 2010 –May 2011.

## SOFTWARE

- Materials Studio Software (materials design)
- HSC Chemistry Software (thermodynamic analysis of hydration reactions)
- Geochemist Workbench Software (thermodynamic analysis of hydration and carbonation reactions)
- SYSTAT Software (statistical analysis)
- Prokon, SAP 2000, Takla (structural analysis and design)
- Abaqus (finite element analysis)
- AutoCad (engineering drawing)
- Microsoft office package (Excel, Word, and PowerPoint)

## TEACHING ACTIVITIES

### Courses Taught:

- |                         |                                 |                 |
|-------------------------|---------------------------------|-----------------|
| • Statics               | • Mechanics of Materials        | • Pavement Lab. |
| • Structural Analysis I | • Construction Materials Lab.   |                 |
| • Surveying Lab.        | • Reinforced Concrete Design II |                 |

### Graduate Courses Taken:

- |                                |                           |                                |
|--------------------------------|---------------------------|--------------------------------|
| • Advanced Reinforced Concrete | • Advanced Mechanics      | • Earthquake Engineering       |
| • Structural Dynamics          | • Advanced Steel Design   | • Advanced Applied Math        |
| • Advanced Concrete Technology | • Advanced Composites     | • Advanced Structural Concrete |
| • Scanning Electron Microscopy | • Finite Element Analysis | • Advanced Finite Element      |
| • Advanced Concrete Materials  |                           |                                |