



## Academic & Professional CV

# Mahdi Bitarafan, Ph.D.

**Assistant Professor**

**Risk Management Research Center**

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## 1. Personal and Academic Information

|                         |                                                                                                                         |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Name</b>             | Mahdi Bitarafan, Ph.D.                                                                                                  |
| <b>Academic Rank</b>    | Assistant Professor                                                                                                     |
| <b>Affiliation</b>      | Risk Management Research Center, International Institute of Earthquake Engineering and Seismology (IIEES), Tehran, Iran |
| <b>Date of Birth</b>    | 13 April 1988                                                                                                           |
| <b>Nationality</b>      | Iranian                                                                                                                 |
| <b>ORCID</b>            | 0000-0003-2814-8704                                                                                                     |
| <b>Scopus Author ID</b> | 55387241400                                                                                                             |
| <b>SciProfiles ID</b>   | 2809596                                                                                                                 |

## 2. Education

| Degree                | Field / Major                              | Institution                                                              | Status / GPA                                    | Dissertation / Thesis / Research Title                                                                              |
|-----------------------|--------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Postdoctoral Research | Geography and Urban Planning               | University of Tehran                                                     | Completed                                       | Developing a Model for Assessing Urban Resilience against Multiple Threats Using Artificial Intelligence Algorithms |
| Ph.D.                 | Civil Engineering - Earthquake Engineering | International Institute of Earthquake Engineering and Seismology (IIEES) | GPA: 17.31/20;<br>Dissertation grade: Excellent | Developing a Model for Rapid Assessment of Urban Resilience against Natural and Man-Made Threats                    |
| M.Sc.                 | Civil Engineering - Structural Engineering | Islamic Azad University, Tabriz Branch                                   | GPA: 16.66/20;<br>Thesis grade: 19.17/20        | Investigation of the Seismic Behavior of Shear Walls in Cold-Formed Steel Structures                                |

| Degree | Field / Major            | Institution                           | Status / GPA                          | Dissertation / Thesis / Research Title                                                                                         |
|--------|--------------------------|---------------------------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| M.Sc.  | Passive Defense - Design | Malek Ashtar University of Technology | GPA: 18.89/20;<br>Thesis grade: 20/20 | Investigation of Architectural Styles and Determination of Architectural Indicators Compatible with Passive Defense Principles |
| B.Sc.  | Civil Engineering        | Shomal University                     | GPA: 16.43/20                         | —                                                                                                                              |

### 3. Areas of Expertise and Research Interests

- Urban and critical infrastructure resilience
- Multi-hazard risk assessment and modelling
- Artificial intelligence and machine learning applications in risk and resilience
- Earthquake engineering, flood risk, and man-made hazards
- Multi-criteria decision-making and uncertainty modelling

### 4. Professional and Executive Experience

| Position               | Organization / Institution                                                                                | Period       |
|------------------------|-----------------------------------------------------------------------------------------------------------|--------------|
| Assistant Professor    | Risk Management Research Center, International Institute of Earthquake Engineering and Seismology (IIEES) | Present      |
| Secretary              | Iranian Scientific Association of Passive Defense                                                         | 2012-Present |
| Deputy Editor-in-Chief | Journal of Safe City                                                                                      | Present      |

### 5. Books and Authored Works

| Year | Book Title                                                                              | Publisher                 |
|------|-----------------------------------------------------------------------------------------|---------------------------|
| 2016 | Requirements for Blast-Resistant Glass Building Facades                                 | Jam-e Jam Publications    |
| 2016 | Designing a Multi-Purpose Urban Furniture Model from the Perspective of Passive Defense | Jam-e Jam Publications    |
| 2015 | Urban Water Supply Network Design with a Passive Defense Approach                       | Jam-e Jam Publications    |
| 2014 | Study Plan for Passive Defense of Urban Wastewater Networks                             | Jam-e Jam Publications    |
| 2013 | Architecture Compatible with Passive Defense: A Review of World Architectural Styles    | Bustan Hamid Publications |
| 2012 | Lessons from the Ahar, Heris and Varzeqan Earthquakes                                   | Elm Afarin Publications   |

## 6. Publications and Scientific Works

### 6.1. Web of Science (ISI/WoS) Indexed Articles

| Year | Article Title                                                                                                                                                        | Journal / Source                                       |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| 2026 | Material Selection for Multi-Hazard Resilient Buildings using an Uncertainty-Aware, Interpretable Decision-Support Framework                                         | Journal of Building Engineering                        |
| 2026 | Constructed urban infrastructure safety prediction under explosive effects using hybrid explainable ML approaches                                                    | Structures                                             |
| 2026 | Evaluating earthquake resilience in urban areas: A novel fuzzy RANCOM approach                                                                                       | Environment, Development and Sustainability            |
| 2023 | Evaluating Natural Hazards in Cities Using a Novel Integrated MCDM Approach (Case Study: Tehran City)                                                                | Mathematics                                            |
| 2019 | The role of façade materials in blast-resistant buildings: an evaluation based on fuzzy Delphi and fuzzy EDAS                                                        | Algorithms                                             |
| 2016 | The architectural evaluation of buildings' indices in explosion crisis management                                                                                    | Alexandria Engineering Journal                         |
| 2016 | Model for rapid assessment of vulnerability of office buildings to blast using SWARA and SMART methods (a case study of Swiss Re Tower)                              | Journal of Civil Engineering and Management            |
| 2016 | Evaluation types of exterior walls to reconstruct Iran earthquake areas (Ahar Heris Varzeqan) by using AHP and fuzzy methods                                         | International Journal of Strategic Property Management |
| 2016 | Evaluation of light supply in the public underground safe spaces by using COPRAS-SWARA methods                                                                       | International Journal of Strategic Property Management |
| 2015 | Reinforcement of laminated glass facades against the blast load                                                                                                      | Journal of Civil Engineering and Management            |
| 2015 | Choosing the best urban tunnels as safe space in crisis using AHP method: a case study in Iran                                                                       | Journal of Architecture and Urbanism                   |
| 2015 | Selecting the optimal composition of architectural forms from the perspective of civil defense using AHP and IHWP methods (online first: 2013)                       | Architectural Engineering and Design Management        |
| 2014 | Evaluation of real-time intelligent sensors for structural health monitoring of bridges based on SWARA-WASPAS: a case in Iran                                        | The Baltic Journal of Road and Bridge Engineering      |
| 2013 | Evaluating the connecting members of cold-formed steel structures in reconstruction of earthquake-prone areas of Iran using AHP                                      | Alexandria Engineering Journal                         |
| 2013 | Developing a new hybrid MCDM method for selection of the optimal alternative of mechanical longitudinal ventilation of tunnel pollutants during automobile accidents | Transport                                              |
| 2013 | Role of architectural space in blast-resistant buildings                                                                                                             | Frontiers of Architectural Research                    |
| 2012 | Evaluating the construction methods of cold-formed steel structures in reconstructing the areas damaged in natural crises, using the methods AHP and COPRAS-G        | Archives of Civil and Mechanical Engineering           |

## 6.2. Scopus-Indexed Articles (Not Duplicated in Web of Science)

| Year | Article Title                                                                                            | Journal / Source                                            |
|------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| 2023 | Identification and assessment of man-made threats to cities using integrated Grey BWM-Grey MARCOS method | Decision Making: Applications in Management and Engineering |
| 2013 | Selecting the Best Design Scenario of the Smart Structure of Bridges for Probably Future Earthquakes     | Procedia Engineering / MBMST 2013                           |

## 6.3. Other International Journal Articles

| Year | Article Title                                                                                                      | Journal / Source                                               |
|------|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| 2015 | Selecting the best architectural form of the office building with the level of non-stop function against explosion | Engineering Structures and Technologies                        |
| 2013 | Evaluation of Types of Shapes of Building Roof Against Explosion                                                   | International Journal of Engineering and Technology            |
| 2012 | Finite Elements Modeling and Analysis of Cold-Formed Steel Frame Shear Walls                                       | International Journal of Engineering and Technology, 4(6), 719 |
| 2012 | The Role of Basic Forms Buildings in Explosion Protection                                                          | International Journal of Science and Advanced Technology       |
| 2012 | Evaluating Prefabrication Level of Shelters Using Hierarchical Analysis Method (AHP)                               | American Journal of Advanced Scientific Research               |
| 2012 | Evaluation of Types of Buildings Entrances against Explosion                                                       | American Journal of Advanced Scientific Research (AJASR), 1(1) |

## 6.4. Peer-Reviewed Iranian Journal Articles

| Year | Article Title                                                                                                                                  | Journal / Source                                            |
|------|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| 2026 | Capacity Assessment of Cold Formed Steel Shear Walls Using Numerical Modeling and Regression Surrogate Model                                   | Modares Mechanical Engineering, 26(06), 451-462             |
| 2026 | Scenario-Calibrated Prioritization of Office Building Materials: A SWARA-SMART Multi-Criteria Framework                                        | Journal of Safe City                                        |
| 2025 | Evaluating Urban Resilience to Flood Risk using the IHWP Method with Emphasis on Building Parcels: A Case Study of Kan Neighbourhood in Tehran | Geographical Urban Planning Research Quarterly              |
| 2025 | Assessing Urban Resiliency Against Terrorist Attacks (Case Study: Baghe-Fayz Neighborhood in Tehran)                                           | Journal of Urban Studies on Space and Place, 9(34), 131-152 |
| 2023 | A Model for Assessing Urban Resilience against Air Attacks Using the IHWP Method: Case Study of District 5 of Tehran                           | Journal of Safe City                                        |
| 2017 | Risk Assessment of Urban Water Supply Systems in Iran against Threats Using the RAMCAP Method                                                  | Water and Wastewater Journal                                |
| 2013 | Evaluation of Retrofitting Methods for Underground Structures against Blast-Induced Threats Using the Analytic Hierarchy Process (AHP)         | Tunnel and Underground Space Engineering                    |
| 2013 | Evaluation of Openings Compatible with Passive Defense Architecture Using the Analytic Hierarchy Process (AHP)                                 | Journal of Architecture and Urban Planning                  |

## 6.5. Preprints and Research in Progress

| Year | Article Title                                                                                                                                 | Journal / Source |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 2026 | Assessing Urban Flood Resilience in Megacities through an Integrated GIS-Q-Rung Orthopair Fuzzy Framework of Socio-Economic and Urban Factors | Preprint         |
| 2026 | Assessing Urban Resilience to High-Impact Security Threats Using Bayesian-Fuzzy GIS Analysis: Evidence from District 5 of Tehran              | Preprint         |

*These items are listed as preprints/research in progress and are not presented as peer-reviewed published journal articles.*

## 6.6. International Conference Papers

| Year | Paper Title                                                                                                                                     | Conference / Venue                                                                                                    |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| 2025 | Development of an Enhanced Artificial Neural Network Model Using the Levenberg-Marquardt Algorithm for Predicting Concrete Compressive Strength | 1st International and 7th National Conference on Mechanical Engineering, Civil Engineering, and Advanced Technologies |
| 2025 | Capacity Assessment of Cold-Formed Steel Shear Walls Using Numerical Modelling and a Regression Surrogate Model                                 | 1st International and 7th National Conference on Mechanical Engineering, Civil Engineering, and Advanced Technologies |
| 2012 | Evaluation of Types of Shapes of Building Roof Against Explosion                                                                                | International Conference on Civil Engineering and Architecture (ICCEA 2012)                                           |
| 2012 | Selecting the Optimal Method of Strengthening WPC Beams with Grooving Method in Order to Prevent FRP Sheets from Debonding Using AHP            | International Conference on Civil Engineering (ICCEN 2012)                                                            |
| 2012 | Evaluation of Building Facades and Strengthening Methods against Blast Waves                                                                    | 9th International Congress on Civil Engineering, Isfahan University of Technology                                     |
| 2012 | Reducing Traffic Accidents through Improvement of Accident-Prone Locations                                                                      | 3rd International Seminar on Traffic Accident Reduction: Challenges and Solutions                                     |

## 6.7. National Conference Papers

| Year | Paper Title                                                                                                | Conference / Venue                                                                                      |
|------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| 2014 | Feasibility Study of Designing a Zero-Energy House in Tehran with Emphasis on Solar Energy                 | 2nd National Conference on Sustainable Architecture and Urban Development                               |
| 2014 | Design Principles and Considerations for Blast-Resistant Entrances from the Perspective of Passive Defense | 2nd National Conference on Sustainable Architecture and Urban Development                               |
| 2014 | Presentation of Entrance Pattern Alternatives for Underground Safe Spaces                                  | 2nd National Conference on Sustainable Architecture and Urban Development                               |
| 2014 | Glass Facades of Buildings Resistant to Blast Waves                                                        | 2nd National Conference on Sustainable Architecture and Urban Development                               |
| 2012 | Entrance Components of Underground Safe Spaces from the Perspective of Passive Defense                     | 2nd Conference on Crisis Management in the Construction Industry, Underground Structures, and Lifelines |

| Year | Paper Title                                                                                                                        | Conference / Venue                                                                                      |
|------|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| 2012 | Evaluation of Construction Methods for Cold-Formed Steel Structures in Reconstruction of Areas Damaged by Natural Crises Using AHP | 2nd National Conference on Crisis Management                                                            |
| 2012 | Evaluation of Entrance Types for Underground Safe Spaces from the Perspective of Passive Defense                                   | 2nd National Conference on Crisis Management                                                            |
| 2012 | Assessment of Entrance Components of Underground Safe Spaces against Threats                                                       | 2nd National Conference on Crisis Management                                                            |
| 2012 | Water Control in Tunnels and Underground Safe Spaces and Their Waterproofing Methods                                               | 2nd National HSE Conference: University–Industry–Private Sector Linkage                                 |
| 2012 | Water Control in Tunnels and Underground Safe Spaces and Their Waterproofing Methods                                               | 3rd Conference on Crisis Management in the Construction Industry                                        |
| 2012 | Blast-Resistant Door Systems for Lifeline Infrastructure                                                                           | 3rd Conference on Crisis Management in the Construction Industry                                        |
| 2012 | Comparison of Asphalt and Concrete Pavements with a Safety-Oriented Approach to Tunnel Fire                                        | 2nd Conference on Crisis Management in the Construction Industry, Underground Structures, and Lifelines |
| 2011 | Evaluation of Retrofitting Methods for Underground Safe Structures against Different Threat Sources                                | 4th National Civil Engineering Conference: Retrofitting and Preservation of Enduring Structures         |
| 2011 | AFA Design Process (Camouflage, Deception, and Concealment)                                                                        | Scientific-Research Conference on Urban Planning and Defensive Architecture                             |
| 2011 | The Role of Retrofitting in Underground Safe Structures against Threats                                                            | 2nd National Conference on Steel Structures                                                             |
| 2011 | Seismic Behavior of Shear Walls in Cold-Formed Steel Frames                                                                        | 2nd National Conference on Steel Structures                                                             |
| 2011 | Spatial Organization with a Passive Defense Approach                                                                               | Scientific-Research Conference on Urban Planning and Defensive Architecture                             |
| 2011 | Passive Defense Considerations in the Design of a Secure Underground Data Center                                                   | 3rd National Passive Defense Conference                                                                 |
| 2011 | Construction-Site Equipment for Underground Safe Spaces with a Passive Defense Approach                                            | Scientific-Research Conference on Urban Planning and Defensive Architecture                             |
| 2010 | The Role of Three-Layer Defensive Strategies in Securing Urban Spaces                                                              | 1st Passive Defense and Resistant Structures Conference, Babol Noshirvani University of Technology      |

## 7. Research Projects

| No. | Research Project                                                                                                                                                                   |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Development of Design Requirements for an Information Technology Data Center: Case Study of the Development Plan of the Islamic Consultative Assembly                              |
| 2   | Development of Design Requirements for a Crisis Management Command Center with a Passive Defense Approach: Case Study of the Development Plan of the Islamic Consultative Assembly |
| 3   | Smart Blast-Resistant Glass Facade: Case Study of the Sheikh Fazlollah Nouri Building (Parliamentary Commissions)                                                                  |
| 4   | Development of a Rapid Architectural Vulnerability Assessment Model for Office Buildings against Blast: Case Study of the Ayatollah Kashani Building                               |
| 5   | Assessment of Urban Safe Spaces and Lifeline Infrastructure with a Passive Defense Approach                                                                                        |

| No. | Research Project                                                                                                                                                    |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6   | Development of a Retrofitting Plan for Existing Buildings against Blast and Earthquake Hazards: Case Study of the Mashruteh Building, Islamic Consultative Assembly |
| 7   | Development of Requirements for Multipurpose Green Spaces for Passive Defense: Case Study of Residential Units for Members of Parliament                            |
| 8   | Development of Requirements for a Multipurpose Mosque with a Passive Defense Approach: Case Study of Shahid Modarres Mosque, Islamic Consultative Assembly          |

## 8. Registered Inventions

| No. | Invention Title                                                                                      | Status     |
|-----|------------------------------------------------------------------------------------------------------|------------|
| 1   | Emergency Access and Exit Device for Underground Spaces                                              | Registered |
| 2   | Spherical Blast-Resistant Door                                                                       | Registered |
| 3   | Multi-Purpose Access and Exit Device                                                                 | Registered |
| 4   | Vehicle-Powered Rotating Floor System for Vehicle Turning                                            | Registered |
| 5   | Transportation System for Underground Safe Spaces                                                    | Registered |
| 6   | System for Preventing Floodwater and Blast Waves from Entering Underground Tunnels                   | Registered |
| 7   | Smart System Resistant to Blast Waves and Floodwater Intrusion in Tunnels and Underground Structures | Registered |
| 8   | Smart Blast-Resistant Window Protection System                                                       | Registered |

## 9. Honors and Awards

| Year | Honor / Award                                                                                                |
|------|--------------------------------------------------------------------------------------------------------------|
| 2014 | Outstanding Manager of the Year, National Passive Defense Organization                                       |
| 2010 | Outstanding M.Sc. Student in Passive Defense - Design, selected by the National Passive Defense Organization |
| 2011 | Outstanding M.Sc. Student in Passive Defense - Design, selected by Malek Ashtar University of Technology     |
| —    | Outstanding Master's Thesis Award, National Passive Defense Organization                                     |

## 10. Peer-Review Activities

| No. | Journal                                             | Publisher       |
|-----|-----------------------------------------------------|-----------------|
| 1   | Engineering Applications of Artificial Intelligence | Elsevier        |
| 2   | European Journal of Operational Research            | Elsevier        |
| 3   | International Journal of Fuzzy Systems              | Springer Nature |

| No. | Journal                                                                | Publisher          |
|-----|------------------------------------------------------------------------|--------------------|
| 4   | International Journal of Management Science and Engineering Management | Taylor & Francis   |
| 5   | Frontiers of Architectural Research                                    | Elsevier / KeAi    |
| 6   | Multidiscipline Modeling in Materials and Structures                   | Emerald Publishing |
| 7   | Civil Engineering and Applied Solutions                                | —                  |
| 8   | Urban Progress Policy-Making Journal                                   | —                  |
| 9   | Journal of Safe City                                                   | —                  |