

FORMATO EUROPEO
PER IL CURRICULUM
VITAE



INFORMAZIONI PERSONALI

Nome **KAMALI, SOROOSH**
Indirizzo

Nazionalità

ESPERIENZA LAVORATIVA

- Date (July 2022 – Present) **RESEARCH FELLOW | SHM SPECIALIST AND SOFTWARE DEVELOPER**
- Nome e indirizzo del datore di lavoro **University of Bologna, Bologna, Italy**
- Tipo di azienda o settore **University**
- Tipo di impiego **Assegnista di Ricerca**
- Principali mansioni e responsabilità **Responsibility:** Research and development of a comprehensive structural health monitoring system for three bridges (steel, masonry, and prestressed concrete) commissioned by the Rete Ferroviaria Italiana (RFI) company, located near Naples, Italy.
Activities
 - Finite element modeling: Constructed Finite Element Models for all bridges using SAP2000. Determined operational static and dynamic loads, including train types, velocities, and loads, and applied appropriate FEM loading for static, dynamic, and moving loads.
 - Initial evaluation: Evaluated the accelerometer, inclinometer, strain gauge, displacement sensor, thermocouples, and laser barriers signals acquired by the acquisition company. Examined SNR, sensitivity, sampling frequency, signal duration, and dynamic range under ambient conditions and train passage.
 - BWATCH software: As a multidisciplinary effort, collaborated with the computer science department to develop a web-based real-time SHM software, BWATCH, aimed at effective anomaly detection and alarm generation for the three bridges.



- Developed software packages: Programmed multiple Python classes and functions for the BWATCH platform, facilitating various engineering analyses, including:
 - Operational modal analysis: Fully automated OMA class for real-time analysis of accelerometers, estimating modal frequencies, mode shapes, and damping ratios every 5 minutes using EFDD and SSI methods.
 - Temperature compensation: Developed a temperature compensation service to mitigate temperature variations from registered modal parameters after acquiring modal frequencies and temperature data for a baseline period.
 - Damage index and alarm threshold: Created a Damage Index service for compensated and non-compensated modal parameters, defined alarm thresholds, designed alarm systems, and developed algorithms to reduce false alarms and calculate damage indexes from features extracted during train passages.
 - Engineering services: Implemented services for extracting engineering features from individual sensors and comparing them with thresholds obtained from engineering calculations by the UNIBO team, including maximum curvature, axial strain, delta stress, displacement, and strain gauge services.
- Model updating: Developed Python code to update the mechanical parameters of SAP2000 bridge models to minimize differences between SAP modal frequencies and experimental data using SAP2000 Open Application Programming Interface (OAPI).
- Damage scenario definition: Defined approximately 150 damage scenarios for all bridges with standardized naming and meticulously simulated them in SAP2000.
- Pseudo-data generation: Engineered Python packages to generate artificial structural responses from all sensors based on damaged FEM models. These automated packages utilized SAP2000 API, simulated damage scenarios, applied temperature variations, considered uncertainties, and simulated ambient signals and dynamic train passages for various train types.
- Damage index evaluation: Tested the damage index classifier for hundreds of scenarios using generated pseudo-data to determine detectable damages for both with-train and without-train datasets.
- Artificial Intelligence -- Classification: Utilized the full pseudo-dataset of damaged bridges to train Deep Neural Network Classification models for damage classification on each bridge.

• Date (August 2020 – June 2022)

• Nome e indirizzo del datore di lavoro

• Tipo di azienda o settore

• Tipo di impiego

Structural and Earthquake Engineer

Petrochemical Industry Design and Engineering Company (PIDEC), Shiraz, Iran

Private Company

Contratto di Lavoro



- Principali mansioni e responsabilità
 - Led the design efforts for over 30 petrochemical structures including pipe racks, pipe bridges, process and utility structures, as well as foundations, encompassing both steel and reinforced concrete systems, and seismically both ordinary and special moment and braced frames.
 - Formulated comprehensive wind design specifications compliant with the latest ASCE standards, along with producing corresponding native files for implementation.
 - Participated in seismic hazard analyses for two major petrochemical sites within PIDE, namely Mahshar Petro-Olefin and Siraf.
 - Innovated and developed two bespoke software solutions for PIDE engineers in the R&D domain in 2021, leveraging Visual Basic programming language:
 - Pump Foundation Design & Drawing Preparation Software: Engineered software to design and automatically generate CAD drawings of pump foundations customized for petrochemical plants, achieving a remarkable efficiency improvement from 3 person-days to just 1 person-hour.
 - Capacity Design of Concentrically Braced Frames Software: Developed cutting-edge software, "Capacity Design of CB Frames," revolutionizing the capacity-based analysis and design of ordinary and special steel concentrically braced structures in adherence to AISC 341 and 360 standards. Leveraging SAP2000 OAPI capabilities, the software offers an extensive range of features, drastically reducing design time from 7 person-days to a mere 1 person-day.

ISTRUZIONE E FORMAZIONE

- | | |
|---|---|
| • Date (September 2018 – August 2023) | Ph.D. of Civil Engineering Earthquake Engineering |
| • Nome e tipo di istituto di istruzione o formazione | Shiraz University of Technology, Shiraz, Iran |
| • Principali materie / abilità professionali oggetto dello studio | Structural Health Monitoring, Operational Modal Analysis, Anomaly Detection, Earthquake Engineering |
| • Qualifica conseguita | Doctor of Philosophy |
| • Livello nella classificazione nazionale (se pertinente) | Dottorato di Ricerca |
| • Date (September 2016 – August 2018) | M.Sc. of Civil Engineering Earthquake Engineering |
| • Nome e tipo di istituto di istruzione o formazione | Shiraz University of Technology, Shiraz, Iran |



- Principali materie / abilità professionali oggetto dello studio
- Qualifica conseguita
 - Livello nella classificazione nazionale (se pertinente)

Structural Health Monitoring, Operational Modal Analysis, Earthquake Engineering, Seismic Design, Finite Elements

Master's Degree
Laurea Magistrale

- Date (September 2016 – August 2018)
- Nome e tipo di istituto di istruzione o formazione
- Principali materie / abilità professionali oggetto dello studio
- Qualifica conseguita
 - Livello nella classificazione nazionale (se pertinente)

B.Sc. of Civil Engineering

Shahid Chamran University of Ahvaz, Ahvaz, Iran

Structural Engineering, Structural Mechanics, Structural Design of Steel and Reinforced Concrete Structures, Dynamics of Structures

Bachelor's Degree
Laurea

CAPACITÀ E COMPETENZE PERSONALI

Acquisite nel corso della vita e della carriera ma non necessariamente riconosciute da certificati e diplomi ufficiali.

PRIMA LINGUA

PERSIANO

ALTRE LINGUE

- Capacità di lettura
- Capacità di scrittura
- Capacità di espressione orale

INGLESE

Eccellente
Eccellente
Eccellente

CAPACITÀ E COMPETENZE RELAZIONALI

Vivere e lavorare con altre persone, in ambiente multiculturale, occupando posti in cui la comunicazione è importante e in situazioni in cui è essenziale lavorare in

THROUGHOUT MY CAREER IN PIDEK COMPANY IN SHIRAZ, I HAD CONSISTENTLY WORKED IN ENVIRONMENTS THAT REQUIRED STRONG COMMUNICATION AND TEAMWORK SKILLS. MY EXPERIENCE INCLUDED COLLABORATING WITH DIVERSE TEAMS WITHIN VARIOUS DEPARTMENTS (STRUCTURAL, MECHANICAL, PROCESS & PIPING, AND ELECTRICAL ENGINEERING), WHERE EFFECTIVE INTERACTION AND COOPERATION WERE CRUCIAL.

AT THE UNIVERSITY OF BOLOGNA, WHERE I WORK AS A SHM SPECIALIST AND POSTDOCTORAL FELLOW, I HAVE THRIVED IN A MULTICULTURAL



squadra (ad es. cultura e sport), ecc.

SETTING. THIS ROLE HAS ALLOWED ME TO ENGAGE WITH INDIVIDUALS FROM DIFFERENT CULTURAL BACKGROUNDS, FOSTERING PROFESSIONAL RELATIONSHIPS AND BUILDING A NETWORK OF COLLEAGUES AND FRIENDS. THESE EXPERIENCES HAVE ENHANCED MY ABILITY TO NAVIGATE AND CONTRIBUTE TO DIVERSE TEAMS, MAKING ME ADEPT AT WORKING COLLABORATIVELY AND COMMUNICATING EFFECTIVELY IN VARIOUS PROFESSIONAL CONTEXTS.

CAPACITÀ E COMPETENZE
ORGANIZZATIVE
Ad es. coordinamento e amministrazione di persone, progetti, bilanci; sul posto di lavoro, in attività di volontariato (ad es. cultura e sport), a casa, ecc.

IN MY ROLE AS A STRUCTURAL ENGINEER AT PIDECA, I MANAGED A TEAM OF FIVE DETAILERS WHO WERE RESPONSIBLE FOR DEVELOPING THE ENGINEERING DRAWINGS BASED ON MY DESIGNS. THIS ROLE REQUIRED EFFECTIVE TIME MANAGEMENT AND A BALANCED APPROACH TO COMMUNICATION, ESPECIALLY WHEN PROVIDING FEEDBACK AND HANDLING REVISIONS. MY ABILITY TO COORDINATE TASKS AND MANAGE WORKFLOW WAS ESSENTIAL IN ENSURING THAT THE PROJECTS WERE COMPLETED ON SCHEDULE AND TO A HIGH STANDARD. ADDITIONALLY, I HAVE EXPERIENCE CO-SUPERVISING FIVE MASTER'S STUDENTS AT THE UNIVERSITY OF BOLOGNA. THIS ROLE INVOLVED OVERSEEING THEIR RESEARCH, PROVIDING GUIDANCE, AND MANAGING THEIR PROGRESS, WHICH FURTHER DEVELOPED MY ORGANIZATIONAL AND LEADERSHIP SKILLS.

CAPACITÀ E COMPETENZE
TECNICHE
Con computer, attrezzature specifiche, macchinari, ecc.

- **PROGRAMMING LANGUAGES:** PYTHON, MATLAB, VB.NET
- **SOFTWARE:** SAP2000, SAP2000 OAPI (PYTHON AND VB.NET), CSI BRIDGE, SAFE, ETABS, ARTEMIS MODAL, GEOPSY, SEISMOSIGNAL, AUTOCAD, FOUNDATION 3D, AUTODESK NAVIS WORKS
- **WRITING TOOLS:** MS OFFICE, LATEX
- **STRUCTURAL HEALTH MONITORING:** SENSOR LAYOUT DESIGN AND SIGNAL INTERPRETATION, OPERATIONAL MODAL ANALYSIS, STRUCTURAL MODEL UPDATING, DAMAGE DETECTION, ENVIRONMENTAL AND OPERATIONAL VARIABILITIES COMPENSATION, MACHINE LEARNING-DRIVEN DAMAGE CLASSIFICATION
- **STRUCTURAL ANALYSIS AND DESIGN:** FINITE ELEMENT MODELING (LINEAR AND NONLINEAR), SEISMIC DESIGN, STEEL AND CONCRETE STRUCTURES, FOUNDATION, PETROCHEMICAL STRUCTURES
- **INTERNATIONAL CODES:** AISC 360, AISC 341, AISC 358, ASCE 07, ACI 318
- **GEOTECHNICAL EARTHQUAKE ENGINEERING:** SEISMIC HAZARD ANALYSIS, SURFACE WAVE TESTS AND MASW
- **OTHER SKILLS:** MULTI-OBJECTIVE OPTIMIZATION USING GA, ABC, PSO AND CLASSICAL METHODS, RELIABILITY AND RISK ANALYSIS, MACHINE LEARNING (MVLN, DNN, RF, ETC.)

CAPACITÀ E COMPETENZE
ARTISTICHE
Musica, scrittura, disegno ecc.

CLASSIC AND ELECTRIC GUITAR



ALTRE CAPACITÀ E
COMPETENZE
*Competenze non
precedentemente indicate.*

ATTACHMENT

PATENTE O PATENTI

ULTERIORI INFORMAZIONI

ATTACHMENT

ALLEGATI

PLEASE REFER TO "SOROOSH_KAMALI_CV_2024.PDF" FOR FULL CV.

Data: 04/09/2024

Firma