Konstantinos E. **Mixios**

Software Engineer

Berlin, Germany

k.mixios@gmail.com | mixiosk.com | iammix | konstantinosmixios

Summary

Seasoned civil engineer with a Master's degree in earthquake and structural engineering, complemented by a successful five-year tenure as a subcontractor software engineer. Proficient in Python, C++, and JavaScript, I've seamlessly integrated my engineering expertise with software development skills to contribute to a diverse range of projects. As a subcontractor for European Research programs and beyond, I've delivered innovative solutions tailored to specific project requirements. From developing computational tools for mechanics, utilizing new era techniques and tools, to contributing to open-source projects, my versatile background uniquely positions me to drive advancements at the intersection of engineering and software engineering. Proficient in cloud technologies (AWS, Docker, Kubernetes) and CI/CD pipelines, with a proven track record in end-to-end software development.

Education

Aristotle University of Thessaloniki

Thessaloniki, Greece

Master of Science in Earthquake and Structural Engineering

Sept. 2018 - Dec. 2019

- Graduation Thesis titled Parametric analysis of monotonic and cyclic behaviour of soil-pipe interaction with finite element method' awarded a 10/10.
- Overall Weighted Average: 8.21/10.

Aristotle University of Thessaloniki

Thessaloniki, Greece

Diploma of Civil Engineering

Sept. 2013 - Sept 2018

- Diploma Thesis titled Development of a Python-based Framework for optimization of concrete plain models simulated in OpenSees using Differential Evolution Algorithms including SSI effects.' awarded a 10/10.
- Overall Weighted Average: 8.05/10.

Experience

Software Engineer

Mar. 2020 - Current

Over the past five years, I have contributed to a range of software development projects, designing and implementing scalable solutions in Python and C++. My work includes developing scientific tools for engineering and data analysis, as well as creating user-friendly front-end applications with React and robust back-end web applications using frameworks like Django and Flask. I also developed SeismoBug, an accelerometer integrating both hardware and software to enable real-time data transmission through Python and UDP/TCP connections. Additionally, I have integrated CI/CD pipelines using tools such as GitHub Actions, automating testing, deployment, and monitoring processes to ensure continuous delivery of high-quality software. I also develop and deploy machine learning models with PyTorch and Scikit-learn for tasks ranging from data processing to predictive analysis, while leveraging technologies like Docker, Kubernetes, and AWS for efficient cloud-based solutions.

Invited Researcher

Toronto, Canada

University of Toronto, Department of Civil and Mineral Engineering

Jul. 2019 - Dec. 2019

During my time as an Invited Researcher at the University of Toronto, I contributed to the H2020 Exchange-Risk project, titled "Experimental and Computational Hybrid Assessment of Natural Gas Pipelines Exposed to Seismic Risk." My primary responsibilities included developing and validating numerical models using the Finite Element Method in OpenSees to replicate and analyze experimental results. This work required proficiency in C++ and multithreading, as the models were executed on Niagara, a high-performance computing cluster at the University of Toronto. Niagara's architecture is optimized for running large parallel jobs (1,040+ cores), enabling efficient execution of scientific codes with a focus on energy efficiency, network performance, and storage capacity.

Intern

Thessaloniki, Greece

Institute of Engineering Seismology and Earthquake Engineering, Research and Technical Institute

Jun. 2017 - Sep. 2017

- Internship

Skills

Software Developing

Languages:
- Python (Advanced)
- C++ (Advanced)
- C (Advanced)
- JavaScript, TypeScript (Intermediate)
- MATLAB (Intermediate)

Libraries:
- Numpy, Scipy, Pandas
- PyTorch, Scikit-learn, Tensorflow
- Matplotlib, Seaborn, Plotly

Frameworks:
- FastAPI
- Django
- Flask
- PyQt
- Dash
- React
- Angular
- Vue.js
- Redux
- expo

Tools:
- Docker, Kubernetes
- Git
- Jira, Confluence, ClickUp, Trello, Notion
- CI/CD (GitHub Actions, CircleCI, Travis CI)
- PostgreSQL, MongoDB

Cloud:
- AWS(EC2, RDS)
- Google Firebase
- Google Cloud Console

Foreign Languages

Greek:
- Mother Tongue

English:
- IELTS Overal Band Score 7.0
- Certificate of English Language Competency, Michigan State University
- Certificate of Competency in English, The University of Michigan

German:
- Goethe-Zertifikat B1

Personal Projects

GiD+OpenSeesPy *Website*

Developer *2024*

- Extended the functionality of the GiD+OpenSees software by implementing code to enable exports to the OpenSeesPy model. This involved transitioning from the generation of OpenSeesTCL files, which was the previous standard, to creating exports compatible with OpenSeesPy.

XFEMPy - Python Library *GitHub*

Developer *2022*

- Extended finite element method for 2D linear-elastic fracture modeling computational library.

SpectralMatchPy - Python Library *GitHub*

Developer *2022*

- Spectral matching of 1 or 2 horizontal earthquake components to a target spectrum of the corresponding Design codes.

DICON BIM Platform *Website*

Developer *2021*

- Pilot bidirectional communication platform for integrated digital representation of construction projects in real-time.

OpenSeesTcl2Py - Python Library *DOI*

Developer *2022*

- Python Library which converts OpenSees models written in Tcl programming language to OpenSees models.

biaxialPy - Python Library *GitHub*

Developer *2021*

- Biaxial Load analysis for concrete sections

OpenSeesPySubstepping - Python Library *DOI*

Developer *Nov 22, 2021*

- Developed a python library where you can create numerical analysis substeps automatically when your the solver is not converging.

Blog related to Engineering and Programming *mixiosk.com*

Blogger *Jul. 2021 - PRESENT*

- Maintaining and updating a personal blog related to structural engineering, implementations of computational mechanics, and programming

Publications

2024 **A model-based damage identification framework for R/C bridges using vibrational measurements,** Konstantinos E. Mixios, Vassilis K. Papanikolaou, Sotiria Stefanidou, Olga Markogiannaki *DOI*
Journal of Physics

2023 **A model-based damage identification framework for R/C bridges using vibrational measurements,** Konstantinos E. Mixios, Vassilis K. Papanikolaou, Sotiria Stefanidou, Olga Markogiannaki
EURODYN2023

2023 **A damage detection approach to assess the performance level of R/C bridges using vibrational response measurements,** Konstantinos E. Mixios, Olga Markogiannaki, Vassilis K. Papanikolaou, Sotiria Stefanidou
COMPDYN2023

2023 **Designing a low-cost wireless sensing system for real time damage assessment of R/C bridges,** Vassilis K. Papanikolaou, Konstantinos E. Mixios, Sotiria Stefanidou, Olga Markogiannaki
COMPDYN2023

2022 **Δυναμική ανάλυση συστήματος γέφυρας αμαξοστοιχίας με την τεχνική της συν-προσομοίωσης (GR),** Mixios E. Konstantinos, Paraskevopoulos Elias, Stefanidou Sotiria, Markogiannaki Olga
5 ΠΣΑΜΤΣ

2022 **Βάση δεδομένων καμπυλών σεισμικής τρωτότητας κτιρίων Ο/Σ (GR),** Mixios E. Konstantinos, Stefanidou Sotiria, Markogiannaki Olga, Argyroudis Sotirios, Fragiadakis Michalis
5 ΠΣΑΜΤΣ

2022 **Database and comparative evaluation of seismic fragility curves for RC buildings,** Sotiria Stefanidou, Olga Markogiannaki, Konstantinos E. Mixios, Sotirios Argyroudis, Michalis Fragiadakis
3rd European conference on earthquake engineering and seismology

2020 **Master Thesis: ”Parametric analysis of monotonic and cyclic behaviour of soil-pipe interaction with finite element method”,** Mixios E. Konstantinos, Supervisor: Manolis George, Oh-Sung Kwon, Sextos Anastasios *DOI*

2019 **A Comparative Experimental Study of Strengthened Columns using Steel Reinforced Grout (SRG) Jacketing,** Katsamakas A. Antonios, Mixios E. Konstantinos, Papanikolaou K. Vassilis, Thermou E. Georgia, Katakalos Konstantinos *Link*

2019 **Σεισμική διακινδύνευση πολεοδομικών ενοτήτων. Εφαρμογή στην πόλη της Θεσσαλονίκης(in Greek),** Evi Riga, Anna Karatzetzou, Sotirios A. Argyroudis, Panagiotis Gavriil, Athanasia Kalampouka, Ioannis Katsavakis, Antonios A. Kstsamakas, Aikaterini Kolitsidaki, Mixios E. Konstantinos, Apostolia Mpantralexi, Vasileios Stamoulis, Nikolaos Stergioulas, Nikolaos Xatzakis, Kyriazis Pitilakis *Link*

2018 **Diploma Thesis: “Development of a Python-based Framework for optimization of concrete plain models simulated in OpenSees using Differential Evolution Algorithms including SSI effects.”,** Mixios E. Konstantinos, Supervisor: Vassilis K. Papanikolaou, Dimitris K. Pitilakis *Link*

2017 **PEER Blind Prediction Contest 2017 Modeling and Analysis Report,** Vassilis K. Papanikolaou, Theocharis Kartalis-Kaounis, Kiveli Mousmoula, Mixios E. Konstantinos, Samouil Psounopoulos