

Nader Zare

MACHINE LEARNING AND ROBOTIC RESEARCHER - FULLSTACK WEB DEVELOPER - C++ AND PYTHON PROGRAMMER

Halifax, Nova Scotia, Canada

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Summary

Senior machine learning researcher and full-stack software developer with 10+ years of experience developing testing and maintaining enterprise software applications implemented in Python, C++, HTML, CSS, and JavaScript. Designing and developing enterprise projects as well as machine learning frameworks to work on the soccer simulation environment. Contributing to the open-source community by making the machine learning projects publicly available. Winning the championship of RoboCup competition as the leader of Cyrus Soccer Simulation 2D team, thanks to Strong programming knowledge in addition to profound machine learning background.

Work Experience

Institute for Big Data Analytics, Dalhousie University

Halifax, Canada

SENIOR RESEARCH ASSISTANT, ROBOTIC AND MACHINE LEARNING

Sep. 2019 - Present

- Developed a vessel navigation framework for training autonomous vessel navigation.
- Employed deep reinforcement learning methods to train autonomous vessels for navigating in a simulation of real-world environments.
- Developed CYRUS, a 2D soccer simulation team, and employed various novel machine learning methods to solve the multi-agent learning problem.
- Applied machine learning algorithms to the CYRUS soccer simulation 2D team and participated in qualified RoboCup competitions.
- Developed the first Python soccer simulation 2D base code called PYRUS2D, consisting of over 20k lines of code.
- Released the most powerful C++ soccer simulation 2D base code by merging Helios and Gliders base codes and applying the best features of the CYRUS team.
- Developed a soccer simulation 2D log analyzer called Cyrus Log Analyzer that can analyze and generate useful statistical reports from soccer simulation 2D game logs powered by Python.
- Improved and upgraded AutoTest2D software for parallel testing of soccer simulation 2D teams powered by bash scripts.
- Developed AutoTune2D software for fine-tuning soccer simulation 2D team parameters.
- Implemented a simple library called CppDnn for using Keras and TensorFlow for feed forwarding in C++.
- Implemented a Python mathematical library called PyrusGeom for working in two-dimensional geometry fields.
- Simplified Helios base code and its library to help junior students participate in the junior RoboCup competition called StarterAgent2D and StarterLibRCSC.
- Created an application containing bash scripts powered by Docker, a web service powered by Django and SQLite, and a Telegram bot for testing and holding soccer simulation 2D tournaments called SS2D-Docker-Tournament-Runner.
- Implemented a new observation model in soccer simulation 2D server to make the player's observation closer to humans and new robots. The server includes over 50k lines of C++ code.

FULL-STACK WEB DEVELOPER OF BALLAST WATER REPORTING FORM INFORMATION SYSTEM

- Developed back-end and front-end of the website powered by Django and MongoDB.
- Implemented an email crawling module to process received emails, download files, parse PDF forms, standardize data, store standardized data in a database, and respond to emails.
- Implemented port and coordinates standardization algorithm to standardize inputs and create suggestions.
- Created web interfaces to help users in filtering queries.
- Improved the performance of the system in many different algorithms such as calculating Ballast Risk Assessment, Updating Geo Location Fields and Updating port scaled parameters by multiprocessing and running tasks in the background.
- Developed unit tests for features and functions.
- Developing an application programming interface(API) to help users to filter and get stored data in JSON format.

PROJECT MANAGER OF BALLAST WATER REPORTING FORM INFORMATION SYSTEM

- Developed and maintained a sensitive system by constant monitoring of the performance.
- Handled different aspects of the project through the entire software development life cycle.
- Coordinated and assisted team members during the development of the project.
- Managed task assignments to team members and collaborated with them throughout the development of the project.
- Engaged with research collaborators at the Department of Fisheries and Oceans Canada (DFO) and the University of Toronto.
- Introduced agile concept and directed project plans.
- Supported and troubleshooted the system in a Ubuntu server.

Peykasa Message ware

Tehran, Iran

C++ AND PYTHON DEVELOPER

Sep 2017 - Mar. 2019

- Developed and designed a C++ component to manage and monitor SMS messages among GSM network providers.
- Built a high-speed, multi-process Python application to store GSM data on ElasticSearch.
- Redesigned and developed an application with components for parsing, creating flow messages, and storing flows on ElasticSearch.
- Conducted integration tests using the Python Robot Framework for GSM C++ components.
- Worked with many different technologies such as Robotframework, Kibana, Elasticsearch, and git.

Education

Khajeh Nasir Toosi University of technology

M.S. IN ARTIFICIAL INTELLIGENT AND ROBOTIC

Tehran, Iran

Sep. 2015 - AUG. 2018

- Thesis: Robust-to-noise Multiagent Decision Making in Stochastic and Dynamic Environment using Reinforcement Learning
- Supervisor: Dr. Amin Nikanjam

SUTECH(Shiraz University of Technology)

B.S. IN INFORMATION TECHNOLOGY ENGINEERING

Shiraz, Iran

Sep. 2010 - June. 2014

- Thesis: Soccer Simulation 2D
- Supervisor: Dr. Seyed Rauf Khayami

Honors & Awards

LEADER OF CYRUS SOCCER SIMULATION 2D TEAM

2022	2nd Place , RoboCup, Worldwide International Robotic Competition, Soccer Simulation 2D League	Bangkok, Thailand
2021	1st Place , RoboCup, Worldwide International Robotic Competition, Soccer Simulation 2D League	Online
2019	3rd Place , RoboCup, Worldwide International Robotic Competition, Soccer Simulation 2D League	Sydney, Australia
2018	2nd Place , RoboCup, Worldwide International Robotic Competition, Soccer Simulation 2D League	Montreal, Canada
2017	4th Place , RoboCup, Worldwide International Robotic Competition, Soccer Simulation 2D League	Nagoya, Japan
2014	5th Place , RoboCup, Worldwide International Robotic Competition, Soccer Simulation 2D League	Joa Pessoa, Brazil
2020	2nd Place , Japan Open RoboCup Competition, Soccer Simulation 2D League	Japan
2018	1st Place , Asia-Pacific RoboCup Competition, Soccer Simulation 2D League	Kish, Iran
2018	1st Place , Iran Open RoboCup Competition, Soccer Simulation 2D League	Tehran, Iran
2014	1st Place , Iran Open RoboCup Competition, Soccer Simulation 2D League	Tehran, Iran

HIGH SCHOOL

2007	2nd Place , 5th National Skill Competition in Fars State	Shiraz, Iran
2007	Qualified in the 1st Round , Iranian Mathematics Olympiad	Iran
2007	Qualified in the 1st Round , Iranian Physic Olympiad	Iran
2006	Qualified in the 1st Round , Iranian Mathematics Olympiad	Iran
2006	Qualified in the 1st Round , Iranian Computer Olympiad	Iran

Skills

Programming Languages

Python, C++, CSS, HTML, JavaScript, R

Data Base

MongoDB, Redis, SQLite, ElasticSearch

Integrated development environment (IDE)

PyCharm, CLion, VSCode, QT Creator, R Studio, MATLAB

Artificial Intelligent Concepts

Deep Learning, Deep Reinforcement Learning,

Machine Learning Frameworks

Keras, Tensorflow, Pandas, NumPy,

OS

Ubuntu, Fedora, Windows,

Technologies

Django, Git, GitLAB, Jenkins, Docker, Robot-Framework,

Publications

Cyrus2D base: Source Code Base for RoboCup 2D Soccer Simulation League

2022

N Zare, O Amini, A Sayareh, M Sarvmali, A Firouzkouhi, SR Rad, ...

RoboCup 2022: Robot World Cup, Springer

Cyrus 2D Simulation Team Description Paper 2022	2022
N Zare, O Amini, A Sayareh, M Sarvmaili, A Firouzskouhi, SR Rad, ... <i>RoboCup 2022 Symposium and Competitions: Team Description Papers. Bangkok, Thailand.</i>	
Improving Dribbling, Passing, and Marking Actions in Soccer Simulation 2D Games Using Machine Learning	2021
N Zare, O Amini, A Sayareh, M Sarvmaili, A Firouzskouhi, S Matwin, ... <i>RoboCup 2021: Robot World Cup XXIV, Springer</i>	
Engineering Features to Improve Pass Prediction in Soccer Simulation 2D Games	2021
N Zare, M Sarvmaili, A Sayareh, O Amini, S Matwin, A Soares <i>RoboCup 2021: Robot World Cup XXIV, Springer</i>	
CYRUS Soccer Simulation 2D Team Description Paper 2021	2021
N Zare, A Sayareh, M Sarvmaili, O Amini, A Soares, S Matwin. <i>RoboCup 2021 Symposium and Competitions: Team Description Papers. Online.</i>	
Using deep reinforcement learning methods for autonomous vessels in 2d environments	2020
M Etemad, N Zare, M Sarvmaili, A Soares, B Brandoli Machado, S Matwin. <i>Canadian Conference on Artificial Intelligence Canadian AI. Canada.</i>	
Cyrus 2D Simulation Team Description Paper 2019	2019
N Zare, M Sarvmaili, O Mehrabian, A Nikanjam, SH Khasteh, A Sayareh, ... <i>RoboCup 2019 Symposium and Competitions: Team Description Papers. Sydney, Australia.</i>	
Cyrus 2D Simulation Team Description Paper 2018	2018
N Zare, M Sadeghipour, A Keshavarzi, M Sarvmaili, A Nikanjam, ... <i>RoboCup 2018 Symposium and Competitions: Team Description Papers. Montreal, Canada.</i>	
Cyrus 2D Simulation Team Description Paper 2017	2017
N Zare A Najimi, M Sarvmaili, ... <i>RoboCup 2017 Symposium and Competitions: Team Description Papers. Nagoya, Japan</i>	
Intelligent and dynamic method to specify chronological order of the games to improve the excitement and fairness of the champions in simulation league	2016
N Zare, A Keshavarzi, SE Beheshtian, H Mowla, A Akbarpour, H Jafari, ... <i>Artificial Intelligence and Robotics (IRANOPEN), 2016. Page 1-6, Publisher IEEE. Tehran, Iran.</i>	
Using Machine Learning approaches to detect opponent formation	2016
E Asali, M Valipour, N Zare, A Afshar, MR Katebzadeh, ... <i>Artificial Intelligence and Robotics (IRANOPEN), 2016. Page 140-144, Publisher IEEE. Tehran, Iran.</i>	
Cyrus 2D Simulation Team Description Paper 2016	2016
N Zare, A Keshavarzi, SE Beheshtian, H Mowla, A Akbarpour, H Jafari, ... <i>RoboCup 2016 Symposium and Competitions: Team Description Papers. Leipzig, Germany.</i>	
Cyrus 2D Simulation Team Description Paper 2015	2015
N Zare, M Karimi, A Keshavarzi, E Asali, HA Poor, A Aminian, ... <i>RoboCup 2015 Symposium and Competitions: Team Description Papers. Hefei, China.</i>	
Cyrus 2D Simulation Team Description Paper 2014	2014
R Khayami, N Zare, M Karimi, P Mahor, A Afshar, MS Najafi, M Asadi, ... <i>RoboCup 2014 Symposium and Competitions: Team Description Papers. Joao Pessoa, Brazil.</i>	
Cyrus 2D Simulation Team Description Paper 2013	2013
N Zare, H Zolanvar, M karimi, P Mahor, F Tekara, E Asali, M Fatehi. <i>RoboCup 2013 Symposium and Competitions: Team Description Papers. Eindhoven, Netherlands.</i>	
Coordination Approach to Find Best Defense Decision with Multiple Possibilities among Robocup Soccer Simulation Team	2013
A Keshavarzi, N Zare. <i>Artificial Intelligence and Robotics (IRANOPEN), 2013. Page 1-6, Publisher IEEE. Tehran, Iran.</i>	

Program Committees

2022	Member of Organization Committee , Soccer Simulation 2D, RoboCup	Bangkok, Thailand
2019	Member of Organization Committee , Soccer Simulation 2D, RoboCup	Sydney, Australia
2018	Member of Organization Committee , Soccer Simulation 2D, RoboCup	Montreal, Canada
2017	Member of Technical Committee , Soccer Simulation 2D, RoboCup	Nagoya, Japan
2016	Member of Technical Committee , Soccer Simulation 2D, RoboCup	Hefei, China
2015	Member of Technical Committee , Soccer Simulation 2D, RoboCup	Leipzig, Germany
2018	Member of Organization Committee , Soccer Simulation 2D, Asia-Pacific RoboCup	Kish, Iran
2022	Member of Executive Committee , Soccer Simulation 2D, IranOpen Robotic Competition	Tehran, Iran
2021	Member of Executive Committee , Soccer Simulation 2D, IranOpen Robotic Competition	Tehran, Iran
2018	Member of Technical and Organization Committee , Soccer Simulation 2D, IranOpen Robotic Competition	Tehran, Iran
2017	Member of Technical and Organization Committee , Soccer Simulation 2D, IranOpen Robotic Competition	Tehran, Iran
2016	Member of Technical and Organization Committee , Soccer Simulation 2D, IranOpen Robotic Competition	Tehran, Iran
2015	Member of Technical and Organization Committee , Soccer Simulation 2D, IranOpen Robotic Competition	Tehran, Iran
2017	General Chair , Soccer Simulation 2D, ShirazOpen Robotic Competition	Shiraz, Iran
2016-2018	Member of Executive Committee , Soccer Simulation 2D, ShirazOpen Robotic Competition	Shiraz, Iran
2010-2014	Member of the Information Technology Scientific Student Association , Shiraz University of Technology	Shiraz, Iran
2014	Vice Chairman of Central Scientific Council Association , Shiraz University of Technology	Shiraz, Iran

TEACHER ASSISTANT

2017	Evolutionary Computing , Dr. Amin Nikanjam, K.N. Toosi University	Tehran, Iran
2017	Reinforcement Learning , Dr. Seyed Hossein Khasteh, K.N. Toosi University	Tehran, Iran
2016	Multi-Agent System , Dr. Amin Nikanjam, K.N. Toosi University	Tehran, Iran
2016	C++ Programming , Dr. Amin Nikanjam, K.N. Toosi University	Tehran, Iran
2016	C++ Programming , Dr. Behrooz Nasihatkon, K.N. Toosi University	Tehran, Iran
2013	Operation System LAB , Dr. Reza Akbari, Shiraz University of Technology	Shiraz, Iran
2013	C++ Programming , Dr. Haghighat, Shiraz University of Technology	Shiraz, Iran
2013	Artificial Intelligence , Dr. Reza Javidan, Shiraz University of Technology	Shiraz, Iran
2012	Operation System LAB , Dr. Omid Booshehrian, Shiraz University of Technology	Shiraz, Iran

Teaching Experiences

2014-2019	Soccer Simulation 2D , Soccer Simulation 2D, Helios base code, C++ and Python programming, Ubuntu, Bash script, Artificial Intelligence: Neural Network, Reinforcement Learning, Tensor Flow and Keras	Atomic Energy High School, Tehran, Iran
	Soccer Simulation 2D , Soccer Simulation 2D, Data Structure, Algorithm, Multi-Agent System, Linux Shell	Shiraz University of Technology, Shiraz, Iran
2013-2015	Programming, C++ Programming, Artificial Intelligence: Searching Algorithm (A*, Greedy), Dynamic Programming	Marvdasht, Iran
2011-2012	Computer and Mathematical Olympiad , Talayeh Daran High School, Marvdash, Iran	Marvdasht, Iran

Presentation

2018	Presenter for Soccer Simulation 2D League and AI , Atomic Energy High School	Tehran, Iran
2018	Presenter for Soccer Simulation 2D League and AI , Atomic Energy High School of Mashhad	Mashhad, Iran
2016	Presenter for Learning Algorithms in RoboCup , K.N. Toosi University	Tehran, Iran
2012	Presenter for Scientific Associations Management, strategic management , S.U. of Technology	Shiraz, Iran
2012	Presenter for Microsoft Sphere Monitor, human control interaction , S.U. of Technology	Shiraz, Iran
2012	Technology World, introducing new technologies , Break time in university, Shiraz University	Shiraz, Iran
2011	Solar Radiation , Physics Teacher Conference of Fars State	Shiraz, Iran

Reference

Prof. Stan Matwin, Dalhousie University, Halifax, Canada., stan@cs.dal.ca

Dr. Amilcar Soares, Memorial University of Newfoundland, St. John's, Canada., amilcarsj@mun.ca