Skills

# Power System Analysis

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| Analysis | Level from 5 | Analysis tool | Level from 5 |
| Power Flow | 5 | PSCAD | 5 |
| Optimal Power Flow | 5 | Simens PSS/E | 5 |
| AC DC load Calc. | 5 | ETAP | 5 |
| Harmonics | 5 | SKM | 5 |
| Power Quality | 5 | PowerGEM TARA | 4 |
| Transient Stability | 5 | ASPEN | 4 |
| Voltage Stability | 5 | CYME | 5 |
| Short Circuit | 5 | Hitachi GRIDVIEW | 4 |
| Motor Starting | 5 | Simulink | 5 |
| Arc Flash Hazard NFPA 70E | 5 | PLEXOS | 3 |
| Arc Flash Hazard IEEE | 5 | Hitachi PROMOD | 2.5 |
| Voltage Drop Calc. | 5 | GE PSLF | 4 |
| Reactive Power | 5 | Mathpower | 5 |
| Generation Interconnection | 5 |  |  |
| Transmission Planning | 4.5 |  |  |
| Demand Response | 4.5 |  |  |
| Unit Commitment | 4 |  |  |
| Generation Retirment | 4 |  |  |
| Load Forcasting | 4 |  |  |
| Power Market Analysis | 4 |  |  |
| Reliability | 3.5 |  |  |
| Microgrids | 3.5 |  |  |
| Contingecy Analysis | 3.5 |  |  |
| EV integration | 4.5 |  |  |
| NERC Compliance | 4 |  |  |
| Renewables Integration | 5 |  |  |

# Power System Desing

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| Design | Level from 5 | Design tool | Level from 5 |
| Drafting | 5 | AutoCAD LT | 5 |
| Lightning Protection Design Emperical Method | 5 | PLS-CADD | 4.5 |
| Lightning Protection Design Rolling Sphere | 5 | Revit | 4 |
| AC Schematics | 5 | Bluebeam | 5 |
| DC Schematics | 5 | Microstation | 4 |
| Wiring Diagrams | 5 | PVSyst | 3.5 |
| Conduit Fill Design | 5 | COMSOL | 4 |
| Bushing Design | 5 | Dialux | 4 |
| Insulation Coordination | 5 | NX Routing | 3 |
| Lighting Desing | 5 |  |  |
| Panel Front | 5 |  |  |
| Surge Arrester Design | 5 |  |  |
| SCADA and Com Design | 5 |  |  |
| Conduit Plan | 5 |  |  |
| SCADA Coding | 5 |  |  |
| AC Transformer Sizing | 5 |  |  |
| Substation Design | 5 |  |  |
| Relay Coordination | 5 |  |  |
| BESS Design | 5 |  |  |
| Swithyard Design | 5 |  |  |
| Relay Setting | 5 |  |  |
| Cable Sizing | 5 |  |  |
| Battery Charger Sizing | 5 |  |  |
| Inverter Design | 5 |  |  |
| Controller Design | 5 |  |  |
| Control House Design | 5 |  |  |
| Grounding Design | 4.5 |  |  |
| NEC Compliance | 4 |  |  |
| IEC Compliance | 4 |  |  |
| IEEE Compliance | 4 |  |  |
| ANSI Compliance | 4 |  |  |
| Transmission Line Design | 3.5 |  |  |
| PV System Desing | 3.5 |  |  |

# Software and Data

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| Task | Level from 5 | Language | Level from 5 |
| Pipelining | 5 | Python | 5 |
| Data Cleansing | 5 | Shell Scripting/CLI | 5 |
| API/REST API | 5 | Git | 5 |
| Object Oriented | 5 | CSS3 | 4 |
| ML | 5 | GITHUB | 5 |
| Deep Learning | 4 | VS CODE | 5 |
| Cloud | 4 | REACT | 4.5 |
| NoSQL | 5 | NODEJS | 4.5 |
| ETL | 5 | NGINX | 4.5 |
| Data Warehousing | 5 | POSTMARK | 4 |
| AWS | 4 | C++ | 5 |
| GCP | 5 | VBA | 5 |
| Azure | 5 | .NET | 3 |
| Data Visualizaton | 5 | HTML5 | 5 |
| Test Code | 5 | SQL | 5 |
| Web Scraping |  | Javascript | 5 |
|  |  | MATLAB | 5 |

Araz Karimi Full list of Projects

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| Title | Description | Skill Set Involved | Title |
| Panel Fabrication, AC and DC elementaries, and wiring interconnection Drawing prepration for a new substation | The drawings are engineered and created (drafted) using AutoCAD LT | AutoCAD LT | Panel Fabrication, AC and DC elementaries, and wiring interconnection Drawing prepration for a new substation |
| Power Flow and Arch Flash Full Report using ETAP | Power Flow Report Preparation of a Full Power System of a Utility Client, with automatic Word File creation with all warnings, tables, and figures for 60 Scenarios and Load Categories, Data Visualization of Relay DATA as Appendix | Python, ETAP, Matplotlib, Git, Github, VS Code | Power Flow and Arch Flash Full Report using ETAP |
| Substation P&C and Physical: Full Line trap removal and line relay change in all Physical and P&C Drawings package | A remote end Relay change, another relay configuration change, Line change and line tuner removal is polulated into more than 600 physical and P&C drawings of a substation. Whole schematics, and wiring SCADA and panels change performed accordingly | AutoCAD, Microstation, Bluebeam | Substation P&C and Physical: Full Line trap removal and line relay change in all Physical and P&C Drawings package |
| Three phase unbalanced LV system optimal power Flow with PVs and Evs with Power Quality improvement features | A MATLAB code is created to model the three-phase unbalanced system and then perform Optimal Power Flow with several existing and proposed engines. Evs and PVs are integrated as controllable objects into the model. Voltage imbalance (A power Quality measure) is implemented in the optimization as a constraint. Several Scenarios were tested and Data Visualization about the Optimal Power Flow is created. An academic Paper is created upon this | MATLAB-CVX-MATHPOWER Visualization -OOP - Latex | Three phase unbalanced LV system optimal power Flow with PVs and Evs with Power Quality improvement features |
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| Digital Implementation of Protection Relays Logic and phase recognittion with MATLAB and Novel Spiral Data Driven Distance Relay Method | First Phase detector algorithms are modelled in MATLAB to extract the magnitude and angle of a signal during fault. On this basis relay protection logics such as Over current, transformer differential, and distance with Power Swing Blocking is Modelled. Finally a new method is proposed to improve performance of relay during power swing in the marginal faults using real-time spiral regression | MATLAB - REGRESSION - PSCAD | Digital Implementation of Protection Relays Logic and phase recognittion with MATLAB and Novel Spiral Data Driven Distance Relay Method |
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| Overhead Transmission Line Design | Mechanical and Electrical Calculation, Specification, Drawing, installation guideline, grid code compliance, Technical Report prepared and presented | PLS-CADD, Office Tools+C6 | Overhead Transmission Line Design |
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| Physical Equipment: Transformer Bushing Design | A Bushing is Modelled in COMSOL and its shape is optimized to reduce electric field tension on the sharp edges | COMSOL | Physical Equipment: Transformer Bushing Design |
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| Data pipeline: Automatic Migration of Excel formatted power system Data into CYME | Having information about a Power System in Excel worksheets created manually by the client, I managed to figure out the relation of the CYME Database and then created a code to format and convert their data into CYME Database without manually modeling the system in CYME | CYME - Access Database - Python | Data pipeline: Automatic Migration of Excel formatted power system Data into CYME |
| Power System Dynamics: AVR, Governor, and PSS Design for a Generator | Tradittional Generator is modeled in detailed in MATLAB simulink. A test scenario of short circuit fualt is designed to test the Genearator. Then using MATLAB SISO Tool AVR, Governer, and PSS controllers are designed to control Generators power voltage and improve stability of the power system | SIMULINK - SISO TOOL | Power System Dynamics: AVR, Governor, and PSS Design for a Generator |
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| Full Microgrid Modeling: DC and AC | Two Microgrids, One AC and one DC are created. Several severe transient and power quality phenomena is implemented as scenarios (Model resiliency test). First Buck and Boost inverters to convert DC to AC with L and LCL filters are designed. Then PID and PR controllers are designed using SISO tool and PID tuner for the inverters. Then these inverters are connected with several loads and phenomena are tested. Finally a tritery control (Droop and average power Sharing) is desinged to coordinate and stabilze the inverters as a whole in the Islanded Microgrid | MATLAB PLEX PSCAD SISO TOOL PID | Full Microgrid Modeling: DC and AC |
| An automated personal scheduling assistant: To Do items integrated into Icalendar format and a task status dashboard | Integrates the To-do list into Calendar format and spreads the items into the schedule based on item length, deadlines, conflicts, types, and priorities. VBA to extract a table of figures into CSV and run a bat file in MS Word | python, Icalendar, VBA, and Shell Scripting, Datetime Library - Git - Github | An automated personal scheduling assistant: To Do items integrated into Icalendar format and a task status dashboard |
| Power System Blog web application using React nodeJS Postmarks and GCP | Another Website was created using React Technology and NodeJS backend. Hosted by GCP cloud | REACT-NODEJS-MongoDB-GCP-Postmark-YAML | Power System Blog web application using React nodeJS Postmarks and GCP |
| Short-Circuit based DG placement tool for MV Networks | A software native script is developed in C++ to perform short circuit study in select buses and export results for each study and automaticly testing the results to generate warnings to aid the placement of new Distributed Generation in the system | C++, PSS/E, Digsilent, DPL | Short-Circuit based DG placement tool for MV Networks |
| Motor Starting Study of cold start Scenario in Tabriz Power Plant | Tabriz power Generation Plant with internal Loads is modelled and motor starting studies are performed to determine the resiliency of the system in Black Start | PSS/E - Cable Sizing -Transient Modeling | Motor Starting Study of cold start Scenario in Tabriz Power Plant |
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| Substation Calculations: P&C and Physical | AC Station Service Transformer Sizing/ Battery and Battery Charger Sizing, Voltage drop and Raceway Fill Calculations, Lighting design using IEEE Rolling Sphere and emperical methods | Microsoft Excel BlueBeam ProjectWise | Substation Calculations: P&C and Physical |
| Substation Physical: QC/QA on the full Physical IFR Drawing Package | Below grade and above grade cable trench and raceway, grounding, and section elevations and detail drawings, plan layouts and lighting equipment are reveiwed for IFC submittal | AutoCAD, Microstation, Bluebeam | Substation Physical: QC/QA on the full Physical IFR Drawing Package |
| Power Flow and Arc Flash Report QA/QC of a Hyperloop Power System | Reviewed and Commented on the ETAP Arch Flash and Power Flow Reports and Conceptual Design proposed for HyperloopTT | ETAP | Power Flow and Arc Flash Report QA/QC of a Hyperloop Power System |
| Complete Design of a distribution system | Instrumentation & Distribution System Design Cable Sizing, Load Estimation, Transformer Selection, Relay Selection, and coordination in PSS/E Grid Code Compliance assessment, Grounding Design, Maneuver points, radial topology design Technical reports are presented, including voltage profiles, load statistics, and planning comment | SKM - CYME | Complete Design of a distribution system |
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| Inverter Small Signal Model: A detail Model using computational approach | Inverter control and operation is modeled using linerization and full phsical model in matlab. 16 Equations were solved parametrically in MATLAB and an explicit equation is derived as an accurate linear inverter small signal model | MATLAB - Symbolic Functions - Text manipulation | Inverter Small Signal Model: A detail Model using computational approach |
| Ivnerter based system protection modeling | MATLAB SIMULINK + MATLAB coding is used to implement overcurrent and distance relays logic into MATLAB simulink to be used by other researchers in their studies | MATLAB - Callback functions | Ivnerter based system protection modeling |
| DC to DC Inverter and Controller Desing | Another Project to design a buck-boost inverter and test scenarios this time modelled in MATLAB SIMULINK with SISO tool for PI controller desing | MATLAB PLEX PSCAD SISO TOOL PID LATEX VISIO | DC to DC Inverter and Controller Desing |
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| Domestic and Industrial Electrical Design | For an industrial System: Lighting Design using Dialux, AC load, cable sizing, and power factor correction calculations. Recepticles and Lighting Circuits and drawings are created | Autocad, Revit, Dialux | Domestic and Industrial Electrical Design |
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| IEEE 18 Bus: Line Outage Contingency Study of an HV Network | PSS/E and DigSilent are used to perform load flow studies in contingency scenarios of N-1 line outages | PSS/E, Digsilent | IEEE 18 Bus: Line Outage Contingency Study of an HV Network |
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| MV system total loss calculation with Load Imbalance Effect | A software native script is developed in C++ to calculate loss of all system in unbalanced conditions and compare the results to figure out trend between rise of imbalance and the system loss | C++ PSS/E | MV system total loss calculation with Load Imbalance Effect |