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RESEARCH EXPERIENCE

Ciphers Modification | Guide – Prof. Virendra Sule *[Jan '16 – Present]*

Languages And Tools – Python, C++, Cython

- Modified ciphers AES/RC4 by forming there clones with additional permutations
- Implemented ciphers in C++ and warped with cython to be called by python script for testing, benchmarking and comparisons
- Performed standard tests to compare the modified version with the standard version in randomness and strength
- Made a python module for testing any kind of cipher with Dieharder test suit, which include NIST and Diehard test vectors
- Developed key based permutation function that is used before cipher algorithm on plain text based on RC4 and ICE algorithms.

Smoothed Particle Hydrodynamics (PySPH) | Guide - Prof. Prabhu Ramachandran *[July '15 – Oct '15]*

Languages And Tools – Python, Docker, Shippable

- PySPH is an open source SPH framework, which is computational method used for simulating fluid flows
- Started with making a **Docker** File and Image for implementation of PySPH on different OS and on **shippable**
- Worked on the initialisation of the improvement of **Nearest Neighbour Particle Search** algorithm by using **tree based** data

WORK EXPERIENCE

Winter Internship at GetFocus

Languages And Tools – Python, CQL, Cassandra, Machine Learning *[Dec '15]*

- Started with automation of formation of xlsx sheets, consisting data for analysing, on servers to run on daily basis with crontab
- Developed an algorithm to detect mapping fraud/mistake using IMU data and a model to compute confidence in each mapper with respect to the other, available with both stateless and stateful options
- Worked on making there existing system, for position prediction, stateful using weighted features as a state and then making a module for testing and benchmarking before embedding in the original system as an additional option
- Developed a lazy learning approach(k-nearest neighbours) to get predictions, later modified this in order to perform eager learning(logistic regression, Support Vector Machine) in the neighbourhood calculated by knn, this was added to there system

Freelancing For Niki.ai

Language And Tools – Java, Natural Language Processing *[Aug '15 – Nov '15]*

- Developed machine learning based algorithm for finding the domain of a query using a modified implementation of the markov model and by accordingly ranking the words
- Developed a module for intent identification of the given query using various NLP techniques
- Implemented an algorithm to classify a query into different classes and initialized the work on Ontology

KEY PROJECTS

Advance Encryption Standard and Data Encryption Standard

Languages And Tools – C++, Python, Qt *[Feb '15 – April '15]*

- Lead a group of 4 in the final project for CS 101 course
- Implemented the AES-128 and DES algorithms in C++ with GUI in Qt. Later implemented AES-128 in python
- Implemented the MD5 hash in python. Working on a self project of digital signature using AES-128 and MD5
- Working on a python script to perform NIST test suites for AES-128 according to the AES Algorithm Validation Suite architecture, performing Know Answer Test, Multi-block Message Test and Monte Carlo Test

Social Engineering and Data Scraping for Entrepreneurship project

Language And Tools – Python, Selenium, Data Scrapping *[Sep '15 – Jan '15]*

- Collected the data for running the market models later and related to the customers for the client
- Performed social network data scrapping of customers and gathered information about potential customers

SELF PROJECTS

Password Analysis

Language And Tools – Python, rockyou list, Cassandra

- Implemented a basic password analyser which will gives some information like password length, letter/symbol/case/number frequency, number of different class, maximum length of the used class, position of the class in the password etc
- Working on including machine learning and NLP to extract out base words in the passwords
- Database is maintained in Cassandra server running on local server and connected with python driver

Mitm & Deauth DOS

Language And Tools – Kali Linux, Aircrak-ng, Ettercap, Raspberry Pi

- Mitm attack: Script for performing arp spoofing with ettercap, while preventing the ram overflowing and storing only required information with etterlog. Working on Mitm over BGP
- Deauth DOS: Perform deauth attack for all the visible AP's over all channels. Jam all the wifi connections
- Both the scripts were then run on raspberry pi for mobility and to cover more area

Spoofing Identity

Language And Tools – Macchanger, Crontab

- Script that changes the mac address for all the previously connected networks, randomly sets a hostname from a given list, disables ipv6, disable echo ping, looks for open port on the system and alerts the user. Crontab can be used with this script

File Transfer Programme

Language And Tools – Python

- Transferring of files using the TCP/IP protocol. One can upload files on a server and than download it accordingly

Django Projects

- Made a django based site for storing and sharing bookmarks, with login. Made the login page for a ITSP project MoodyTube

Advertising Model

Language And Tools – R, k-means

- Wrote a script for finding the best linear regression model from different families like Gaussian, Poison etc. using p-values over the training set using k-means and comparing mean square error

OTHER TECHNICAL PROJECTS

Other Technical Projects:

Best Design in XLR8 Robotics Project And competition *['14]*

- Awarded the Best Design Award for being the only team to implement a three-wheeler remote controlled robot

RC plane *['14]*

- Made Remote Controlled plane and participated in the RC plane competition

Low Cost DC Invertor *['11 - '12]*

- Stood **first** in the Kota, Rajasthan district in the Science Exhibition and got selected for state level, out of a total of more than a 100 projects from around the Kota District
- Stood **first** in the School Model Mania hosted by Rajasthan Technical University, Kota
- Stood **first** in the **State Level Science Exhibition** and Model, out of over 50 total projects that came district level
- Represented Rajasthan in the **Western India Science Fair** in Mumbai.

RELEVANT COURSES

High Performance Scientific Computing	***Numerical Analysis***
Engineering Design Optimization	***Linear Algebra***
Data Analysis and Interpretation	***Engineering Design Optimization***
Differential Equations	***Computer Programming and Utilization***
Space Flight Mechanics	***Calculus***

Relevant Skills

Programming languages: Python, C++, C, R, HTML, Java, Ruby, Bash
Database & Query language: Cassandra, CQL | **Web Framework:** Django
GUI: Qt | **Others:** Docker, Metasploit, OpenCV, MPI, OpenMp