ZACKARY CROSLEY

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EDUCATION

MASTER'S OF SCIENCE

Computer Science · Arizona State University · GPA 3.80 · Aug 2019

BACHELOR'S OF SCIENCE

Computer Science · Arizona State University · GPA 3.69 (Magna Cum Laude) · Dec 2017

EXPERIENCE

OPERATIONS RESEARCH ANALYST GS-12

The Research and Analysis Center · Army Futures Command · May 2018 – Present

Served as developer on a Combined Arms Analysis Tool for the 21st Century (COMBATXXI), a stochastic (Monte Carlo), high resolution, closed-form, discrete event combat simulation. Created a navigation suite in Python to aid in rapid implementation of maneuver behaviors. Navigation suite was a graph data structure loaded from terrain, including user defined routes, terrain embedded roads, and buildings. Graph data structure stored dictionary on nodes and edges to facilitate intelligent searching and knowledge management. Operations on graph data structure implemented using functional programming approach, utilizing memoization and lazy evaluation for efficiency. Implemented multiple search methods (A*, Djikstra, Ant Colony Optimization) and heuristics to perform graph searches. Path manipulation algorithms developed to create bounding maneuver order stack from path. Developed framework for Utility AI based on publications by Kevin Dill. Framework enabled the definition of utility considerations (model state variables) for use in calculations. Users defined utility measure (single or dual utility), normalization method for each consideration, aggregation methodology for combining considerations into single value, and selection method for choosing action from utility measures (absolute, relative). Utility was used to develop numerous autonomous behaviors, particularly engagement decisions. Utility was also used as a methodology for implementing terrain reasoning. Terrain reasoning developed as a sequence of sampling terrain and evaluating locations based on utility. Environment querying was used to create UAS swarm behaviors and automated tank defilade. Lead developer on implementing directed energy weapons in combat model. Led definition of approach and worked with analysts to determine feasible, high-fidelity implementation. Served as lead developer for analysis of alternative study, responsible for developing model changes required for the study measurement space.

STUDENT RESEARCHER

Security Engineering for Future Computing Lab · Arizona State University · Jul 2017 – Aug 2019

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COMPUTER SCIENCE INTERN

Patuxent River Naval Air Station · High Performance Computing Division · Jun 2015 – Aug 2016

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PUBLICATIONS

AUTOMATED REFLECTION OF CTF HOSTILE EXPLOITS (ARCHES)

Z Crosley · A Doupe · Y Shoshitaishvili · R Wang

MINING ASSOCIATIONS IN LARGE GRAPHS FOR DYNAMICALLY INCREMENTED MARKED NODES

A Rai · Z Crosley · S Pacham

PROFICIENCIES

Python	Julia	LaTeX	Pwntools
Java	SQL	Pandas	Numpy
C++	Linux	Numpy	Neo4j
Clojure	Bash	Scapy	OpenMP

HONORS