RUSTAM KOSHERBAY

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Education

St. Olaf College, Northfield, MN — B.A. in computer science anticipated 2019

Breck School, Golden Valley, MN — Diploma 2015

Research

Independent research project, Augsburg College — Summer 2013

- Title: Fabricating a Miniature Langmuir Trough to Facilitate Climate Change Studies
- Responsibilities: Worked as a team with a classmate under the guidance of Prof. Stottrup in the Biophysics Lab:
  - 498.5 hours of lab work;
  - Built electrical circuitry using Arduino MEGA and a PID-controlled pump system;
  - Developed five miniature Langmuir trough prototypes before the successful prototype;
  - Developed a PowerPoint and poster presentation, wrote 20-page research paper, kept a thorough lab notebook;
  - Created digital illustrations and animations using Blender and Google Sketch Up to illustrate the Langmuir trough.

Independent research project, University of Minnesota — Summer 2014

- Title: Programming a Flight Simulator with a Virtual Drone to Generate Energy-efficient Paths over Farm Fields to Monitor Agricultural Crops
- Responsibilities: Worked independently under the guidance of Prof. Guy in the Applied Motion Lab:
  - 270 hours of lab work;
  - Employed Monte Carlo methods, specifically simulated annealing, to approach the “traveling salesman” problem;
  - Developed mathematical functions to achieve maximal field coverage with minimal energy consumption;
  - Established that sinusoidal patterns that farmers typically use to plant and harvest crops are significantly less effective than logarithmic spiral patterns or computer-randomized patterns ($p < 0.05$);
  - Determined the most efficient flight path overall was achieved with a flight pattern that was initially computer randomized with a-value of 0.7, which gives 70% priority to distance-traveled and 30% priority to area-of-vision;
  - Developed a PowerPoint and poster presentation, wrote 20-page research paper, kept a thorough lab notebook.

Volunteer research, University of Minnesota — Summer 2017

- Responsibilities: Worked independently under the guidance of Prof. Yuk Sham in the Department of Integrative Biology and Psychology:
- 250 hours of lab work
- Used a supercomputer for protein folding simulations
- Wrote programs in C++ to calculate solvation energy

Work Experience

Technology Consulting Assistant, St. Olaf College Summer 2016

- Worked in a team of six students to resolve technology-related issues on campus, which included: fixing printers, reinstalling drivers;
- Answered phone calls to help students and staff with account issues, such as forgotten passwords and hacked emails;
- Documented occurring problems for future workers.

Campus Involvement

President of Thorson Hall, St. Olaf College 2016-present

- Organize and lead weekly meetings with hall council members and hall representatives;
- Plan monthly events for hall residents;
- Track the budget and solicit funds when necessary;
- Attend weekly meetings with other hall presidents to plan hall meeting agendas;
- Plan and organize a big event with other hall presidents for campus residents each semester.

Science Awards

- Minnesota Scholar of Distinction 2015
- Stem Communicator Award Finalist 2015
- Stem Communicator Award Semifinalist 2014
- ExploraVision National Semifinalist 2014
- Tri-state Junior State and Humanities Symposium Finalist 2014 & 2015
- MAS State Science Fair Awards 2015
  Silver Grand Award
  US Army Award
  Air Force Award
  SAS Institute – JMP Division Award
- Twin Cities Regional Science Fair Awards 2015
  American Space Frontier Society Award
  Mu Alpha Theta Award
  ISEF Alumni Award
- Twin Cities Regional Science Fair Awards 2014
  1st Place Sponsor Award Alliant
  1st Place Sponsor Award Isthmus Engineering
  University of Minnesota College of Science and Engineering Award
  Stockholm Junior Water Prize

Pending Publication

Minnesota Academy of Science. “Programming a Flight Simulator with a Drone to Generate Energy-Efficient Paths Over Farm Fields to Monitor Agricultural Crops,” 2015.

Skills

LabVIEW, C++, Javascript, Python, VPython, C#, Unity3D, ChemDraw, Blender, Arduino prototyping