

Science Undergraduate Laboratory Internships (SULI)

Summer 2022 - Application for: James Lynch

APPLICANT PROFILE

General Applicant Information

First Name: James

Middle Name:

Last Name: Lynch

Previous Last Name(s):

Primary Email Address: jamlynch6@gmail.com

Alternate Email Address 1: derpymcfluffbutt@gmail.com

Alternate Email Address 2:

ORCID: [0000-0002-1854-5266](https://orcid.org/0000-0002-1854-5266)

Current Address

Primary Phone Number: 732-749-5337

Alternate Phone Number:

Citizenship/Languages/Eligibility Information

I will be 18 years of age or older by the time the internship begins: Yes

Are you a U.S. Citizen? Yes

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EDUCATIONAL BACKGROUND

Academic Information

Are you currently attending a community college or 2-year college?

No

Current academic status:

Senior

If you are selected as a participant in this DOE program, will you receive academic credit from your university/college for participating?

No

Undergraduate Institution Information

College/University Country: United States and U.S. Territories

College/University State/Province/Territory: New Jersey

College/University Name: Rowan University

College/University Address: 201 Mullica Hill Rd

College/University City: Glassboro

College/University Zip Code: 08028-1702

Expected/Declared Major: Engineering - Electrical - Electrical Engineering and Computer Science

Minor and/or Concentration Expected/Declared: Computer Sciences and Information Technology

Expected Degree From This College/University: Bachelor's

Expected/Completed Graduation Date: May / 2023

Transcript: AcademicTranscript._spring2022.pdf

Does this institution provide grades? Yes

GPA Scale: 4.0

Total Attempted Credits: 115.00

Total Earned Credits: 95.00

Total Quality Points: 307.20

GPA: 3.23

Science Undergraduate Laboratory Internships (SULI)

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Science, Technology, Engineering and Mathematics (STEM) Courses

Course Title: Complex Digital System Design

Course Number: 09402

Enrollment Status: Currently Enrolled

Course Title: Electrical Communication Systems

Course Number: 09433

Enrollment Status: Recently Completed

Course Title: Intro to Memristor / Nanoelectronic VLSI

Course Number: 09482

Enrollment Status: Recently Completed

Course Title: Junior Engineering Clinic

Course Number: 01303

Enrollment Status: Currently Enrolled

Course Title: Object Oriented Programming / Data Abstraction

Course Number: 04114

Enrollment Status: Currently Enrolled

Course Title: SoC Design / Analysis

Course Number: 09402

Enrollment Status: Recently Completed

Course Title: Very Large Scale Integration

Course Number: 09414

Enrollment Status: Recently Completed

High School Graduation or GED

Date of High School Graduation or GED: June / 2018

Country: United States

City: Wall Township

State/Province/Territory: NJ

Science Undergraduate Laboratory Internships (SULI)

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WORK EXPERIENCE & SKILLS

Work Experience

Name of Place of Employment or Activity:	Sony Music Entertainment
Dates of Employment or Activity:	From 6/3/2021 To 8/20/2021
Hours Per Week:	24.0
Primary Duties:	develop and replicate a ML ETL pipeline from CRON jobs and shell scripts to python with Apache Airflow
Tasks Performed:	developed and replicated a ML ETL pipeline from CRON jobs and shell scripts to python with Apache Airflow

Name of Place of Employment or Activity:	Staples Inc.
Dates of Employment or Activity:	From 5/16/2019 To 1/17/2020
Hours Per Week:	40.0
Primary Duties:	Tech and Office Supplies Associate, Diagnoses and repair consumer electronics such as laptops, desktops, and cellphones. Sells Intel equipped products such as laptops and desktops. Offers virus protection and removal services.
Tasks Performed:	Diagnosed and repaired electronics equipment

Professional Associations

Are you a member of any professional organizations?	Yes
Professional associations you are affiliated with:	American Indian Science and Engineering Society

Computer Skills

Computer related skills:	<p>Languages: MATLAB, C, C++, Verilog, Java, SQL, Python, Shell Scripting, Bash, Scala/Chisel3, Assembly</p> <p>Software: Quartus Prime, TINA-TI, Modelsim, AutoCAD, Cadence Virtuoso, Chipyard, GitHub</p> <p>Hardware: Intel FPGA DE10-Lite Board, TI MSP430 Launchpad</p>
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Laboratory/Technical Skills

Experience with advanced laboratory techniques or equipment:	<ul style="list-style-type: none"> • 4-1 Multiplexer Design using Transmission Gates – Very Large Scale Integration • Spiking Neural Network Training Hardware Accelerator – Engineering Clinic • Machine Learning ETL Pipeline Project – Sony Music Entertainment • Audio Electronics Application of Memristor Hardware Modeling – Intro to Memristor VLSI • LEGv8 FPU Implementation - Advanced Computer Architecture
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Science Undergraduate Laboratory Internships (SULI)

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PROGRAM INFORMATION

Eligibility

Have you previously participated in 2
SULI appointments? No

Previous DOE Internship/Fellowship Experience

Have you ever had an
internship/fellowship with the
Department of Energy or any of its
National Laboratories? No

Availability

What is the earliest date you can
begin your internship? 5/9/2022

When do you need to complete your
internship? 8/19/2022

First Choice Host DOE Laboratory

DOE Laboratory: Oak Ridge National Laboratory (ORNL)

First Choice Research Area: Engineering Computer

Second Choice Research Area: Engineering Electrical

Third Choice Research Area: Quantum Simulation

Second Choice Host DOE Laboratory

DOE Laboratory: Thomas Jefferson National Accelerator Facility (TJNAF)

First Choice Research Area: Engineering Computer

Second Choice Research Area: Computer Science and Technologies

Third Choice Research Area: Accelerator Physics/Science

Relatives Employed at DOE Laboratories

Are you a relative of an employee at
the proposed host DOE laboratories? No

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ESSAYS

Research Experience:	I have completed many team oriented research projects in my undergraduate studies, many of which we split work loads into smaller teams which suited individual skills of each peer, and collaborated on general workflow and organization of the implementation and simulation. I end up having a leadership type role in these projects, taking the lead when discussing what to do next and how to approach it.
Research Interests:	I am very interested in computer architecture, hardware development and hardware accelerators. One of my professors worked very closely with the relevant computer architecture group at Oak Ridge National Laboratory in his postdoc and highly recommends the laboratory and area of study given my skillset. I am very much interested in expressing my creativity through design and research, as I am a very artistic person and enjoy applying those creative qualities to a more technical application.
Personal Experience:	I have gained a great deal of interpersonal and leadership skills through my experience at Rowan Alternative Music, having to collaborate with bands and venues, making sure adequate equipment is available, and coordinating these large scale events, essentially using a skillset similar to that of what a small business would incur. I have taken these skills and applied them to projects and research done in my undergraduate studies and due to these skills and experiences I hold, I end up taking a leadership position in many of these projects, with my peers looking to me to do so as well. I find that upholding a leadership position helps me better understand and wrap my head around the current issues and problems faced within a given project and better equips me to tackle them.
Professional Goals:	My long term professional goals are grounded in my unique creative approach. I come from a very artistic and creative background such that I view problems with the technical analysis of engineering but with the creative flair and originality of art and music. I would like to be able to apply and utilize these skills together to help create new methods and designs within hardware development. Additionally, my Grandfather worked at AT&T Bell Labs for over 60 years, helping develop some of the most important technology of the 20th century and I feel a very strong obligation to continue his passion, drive and work ethic onto my professional endeavors.

RECOMMENDATIONS

Recommendation 1:	First Name: Dwaipayan Last Name: Chakraborty Email: chakraborty@rowan.edu Status: Received 1/12/2022
Recommendation 2:	First Name: Shreekanth Last Name: Mandayam Email: Shreek@rowan.edu Status: Received 1/11/2022

Transcript Data
STUDENT INFORMATION

Name :	James O. Lynch
Curriculum Information	
Program	
Bachelor of Science	
College:	College of Engineering
Major and Department:	Elect & Computer Engineering, Electrical & Computer Engin
Minor:	Computer Science

This is NOT an Official Transcript

TRANSFER CREDIT ACCEPTED BY INSTITUTION -Top-

TRANSFER CRD:	Brookdale Community College						
Subject	Course	Title	Grade	Credit Hours	Quality Points	R	
ECON	04101	INTRO ECON-MACROECON	TA-	3.000		0.00	I
MUSG	06109	MUSIC APPRECIATION	TA	3.000		0.00	I
RTF	03270	FILM HISTORY TO 1940	TD	3.000		0.00	I
		Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:		9.000	9.000	9.000	0.000	0.00	0.000

Unofficial Transcript

INSTITUTION CREDIT -Top-

Term: Fall 2018									
College:		College of Engineering							
Major:		Elect & Computer Engineering							
Academic Standing:									
Subject		Course Level Title			Grade	Credit Hours	Quality Points	R ...	
ECE	09241	UG	INTRO TO DIGITAL SYSTEMS			B	3.000	9.00	
ENGR	01101	UG	FRESH ENG CLINIC I-RS-LC			C	2.000	4.00	
ENGR	01391	UG	INDEP STUDY-ELC SEMINAR			A	0.000	0.00	I
MATH	01130	UG	CALCULUS I			B-	4.000	10.80	
PHIL	09120	UG	INTRO TO PHILOSOPHY			A	3.000	12.00	
PHYS	00220	UG	INTRODUCTORY MECHANICS			B+	4.000	13.20	
Term Totals (Undergraduate)									
		Attempt Hours			Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:		16.000			16.000	16.000	16.000	49.00	3.063
Cumulative:		16.000			16.000	16.000	16.000	49.00	3.063

Unofficial Transcript

Term: Spring 2019

College: College of Engineering
Major: Elect & Computer Engineering
Academic Standing: Good Standing

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
COMP	01111	UG	COLLEGE COMPOSITION I	C	3.000	6.00	
CS	04103	UG	COMPUTER SCI & PROGM	B+	4.000	13.20	
ENGR	01102	UG	ELC FRESH ENG CLINIC II	A-	2.000	7.40	
ENGR	01391	UG	INDEP STUDY-ELC SEMINAR	A	0.000	0.00	I
MATH	01131	UG	CALCULUS II	B	4.000	12.00	
PHYS	00222	UG	INTRO ELECTRICITY/MAGNETISM	B+	4.000	13.20	

Term Totals (Undergraduate)

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	17.000	17.000	17.000	17.000	51.80	3.047
Cumulative:	33.000	33.000	33.000	33.000	100.80	3.055

Unofficial Transcript

Term: Fall 2019

College: College of Engineering
Major: Elect & Computer Engineering
Academic Standing: Good Standing

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
BIOL	10210	UG	HUMAN ANATOMY & PHYSIOLOGY I	C	4.000	8.00	
ECE	09203	UG	PRINC ELEC CIRCUIT ANALYSIS	B	4.000	12.00	
ENGR	01201	UG	SOPH ENG CLINIC I	A-	4.000	14.80	
MATH	01230	UG	CALCULUS III	C+	4.000	9.20	

Term Totals (Undergraduate)

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	16.000	16.000	16.000	16.000	44.00	2.750
Cumulative:	49.000	49.000	49.000	49.000	144.80	2.955

Unofficial Transcript

Term: Spring 2020

College: College of Engineering
Major: Elect & Computer Engineering
Academic Standing: Good Standing

Subject	Course	Level	Title	Grade	Credit Hours	Quality Points	R
CS	04225	UG	PRINCIPLES OF DATA STRUCTURES	A	3.000	12.00	
ECE	09243	UG	COMPUTER ARCHITECTURE	A-	3.000	11.10	
ENGR	01202	UG	SOPH ENG CLINIC II	P	4.000	0.00	
MATH	01235	UG	MATH FOR ENGR ANALYSIS	P	4.000	0.00	

Term Totals (Undergraduate)

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	14.000	14.000	14.000	6.000	23.10	3.850
Cumulative:	63.000	63.000	63.000	55.000	167.90	3.053

Unofficial Transcript

Term: Summer 2020
College: College of Engineering
Major: Elect & Computer Engineering
Academic Standing:

Subject	Course Level Title	Grade	Credit Hours	Quality Points	R
ONL	00100 UG ROWAN ONLINE IMMERSION	S	0.000	0.00	
Term Totals (Undergraduate)					

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	0.000	0.000	0.000	0.000	0.00	0.000
Cumulative:	63.000	63.000	63.000	55.000	167.90	3.053

Unofficial Transcript

Term: Fall 2020
College: College of Engineering
Major: Elect & Computer Engineering
Academic Standing:
Additional Standing: Dean's List

Subject	Course Level Title	Grade	Credit Hours	Quality Points	R
ECE	09303 UG ENGINEERING ELECTROMAGNETICS	B-	3.000	8.10	
ECE	09341 UG SIGNALS AND SYSTEMS	A	2.000	8.00	
ECE	09342 UG INTRO TO EMBEDDED SYSTEMS	A	3.000	12.00	
ECE	09402 UG TP IN ECE:ADV COMP ARCH	A	3.000	12.00 I	
ENGR	01391 UG IS:ECE SAFETY TRAINING	A	0.000	0.00 I	
ME	10320 UG PRIN MECH ENGR FOR ECE MAJORS	A	3.000	12.00	
Term Totals (Undergraduate)					

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	14.000	14.000	14.000	14.000	52.10	3.721
Cumulative:	77.000	77.000	77.000	69.000	220.00	3.188

Unofficial Transcript

Term: Spring 2021
College: College of Engineering
Major: Elect & Computer Engineering
Academic Standing: Good Standing
Additional Standing: Dean's List

Subject	Course Level Title	Grade	Credit Hours	Quality Points	R
ECE	09311 UG ELECTRONICS I	A	3.000	12.00	
ECE	09351 UG DIGITAL SIGNAL PROCESSING	A-	3.000	11.10	
ECE	09402 UG TPS ECE:INTRO TO BLOCKCHAIN	P	3.000	0.00 I	
ECE	09482 UG INTRO MEMRIST/NANO ELECTR VLSI	B+	3.000	9.90	
PHIL	09240 UG SOCIAL & POLITICAL PHILOSOPHY	A-	3.000	11.10	
Term Totals (Undergraduate)					

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	15.000	15.000	15.000	12.000	44.10	3.675
Cumulative:	92.000	92.000	92.000	81.000	264.10	3.260

Unofficial Transcript

Term: Fall 2021
College: College of Engineering
Major: Elect & Computer Engineering
Academic Standing:

Subject	Course Level	Title	Grade	Credit Hours	Quality Points	R
ECE	09402	UG TPS ECE:SOC DESIGN/ANALYSIS	A	3.000	12.00	I
ECE	09414	UG VERY LARGE SCALE INTEGRATION	C	3.000	6.00	
ECE	09433	UG ELECTRICAL COMMUNIC SYSTEMS	A-	3.000	11.10	
ENGR	01303	UG JUNIOR ENGINEERING CLINIC	A	2.000	8.00	
ENGR	01391	UG IS:ECE SAFETY TRAINING	P	0.000	0.00	I
MATH	03160	UG DISCRETE STRUCTURES	C	3.000	6.00	

Term Totals (Undergraduate)

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Current Term:	14.000	14.000	14.000	14.000	43.10	3.079
Cumulative:	106.000	106.000	106.000	95.000	307.20	3.234

Unofficial Transcript

TRANSCRIPT TOTALS (UNDERGRADUATE) -Top-

	Attempt Hours	Passed Hours	Earned Hours	GPA Hours	Quality Points	GPA
Overall:	115.000	115.000	115.000	95.000	307.20	3.234

Unofficial Transcript

COURSES IN PROGRESS -Top-

Term: Fall 2021
College: College of Engineering
Major: Elect & Computer Engineering
Subject Course Level Title

Subject	Course Level	Title	Credit Hours
ECE	09414	UG VERY LARGE SCALE INTEGRATION	3.000

Unofficial Transcript

Term: Spring 2022
College: College of Engineering
Major: Elect & Computer Engineering
Subject Course Level Title

Subject	Course Level	Title	Credit Hours
CS	04114	UG OBJ-ORIENT PRGRM/DATA ABSTR	3.000
ECE	09321	UG SYSTEMS AND CONTROL I	3.000
ECE	09363	UG MODULES IN ECE	1.000
ECE	09402	UG TP ECE:COMPLEX DIGITAL SYS DES	3.000
ENGR	01303	UG JUNIOR ENGINEERING CLINIC	2.000

Unofficial Transcript

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SULI PROGRAM APPLICATION RECOMMENDATION FOR JAMES LYNCH

Recommender Contact Information

- **First Name:** Shreekanth
- **Last Name:** Mandayam
- **Title:** Professor
- **Department:** Electrical & Computer Engineering
- **Institution/Organization:** Rowan University
- **Telephone:** 856-256-5333
- **Email:** shreek@rowan.edu

Applicant Information

Association

Describe your relationship to the applicant, including how long you've known the applicant, where, and in what capacity.

As a student in my senior level core class in Electrical Communications Systems in Fall 2021

Applicant Comments

Please provide substantive comments about the applicant's education, training, aptitude, or promise relevant to the SULI program. Include any relevant additional detail or perspective regarding the applicant's research experience or equivalent experience on complex projects, including the level of independence or other factors that would contribute to the applicant's ability to make an excellent contribution to the SULI program.

James Lynch was an excellent student in my class and distinguished himself with his diligence, scholastic aptitude, creativity and ingenuity. He excelled both individually and in team work. His communication skills, both oral and written were noteworthy; his laboratory reports exceeded expectations. I have no doubt that he will bring credit to Oak Ridge.

Applicant Rating

In comparison to other undergraduate students, please rate the applicant relative to his/her peers on the following qualifications:

	Do Not Know	Below Average	Average	Above Average	Superior
Analytical and Mathematical					X
Experimental Research					X
Overall Academic					X
Initiative and Self Reliance					X
Motivation toward Scientific Career					X
Originality of Thought					X
Emotional Maturity					X
Ability to Work with Others					X
Potential for Leadership				X	
Oral Communication Skills					X
Written Communication Skills					X

SULI PROGRAM APPLICATION RECOMMENDATION FOR JAMES LYNCH

Recommender Contact Information

- **First Name:** Dwaipayan
- **Last Name:** Chakraborty
- **Title:** Assistant Professor
- **Department:** Electrical and Computer Engineering
- **Institution/Organization:** Rowan University
- **Telephone:** 856-256-5335
- **Email:** chakraborty@rowan.edu

Applicant Information

Association

Describe your relationship to the applicant, including how long you've known the applicant, where, and in what capacity.

I have known James since the Fall of 2019. He was one of the students in my Advanced Computer Architecture course, and is currently a student in one of my Engineering Clinic projects, focused on designing hardware accelerators for training spiking neural networks. Engineering Clinic is Rowan University's signature capstone course where students work with faculty members on research projects. James was also a student in two of the courses I have taught - Advanced Computer Architecture, and Design and Analysis of Systems-on-Chips. It is worth noting that James has done very well in the more advanced courses related to computer architecture.

Applicant Comments

Please provide substantive comments about the applicant's education, training, aptitude, or promise relevant to the SULI program. Include any relevant additional detail or perspective regarding the applicant's research experience or equivalent experience on complex projects, including the level of independence or other factors that would contribute to the applicant's ability to make an excellent contribution to the SULI program.

James is an extremely diligent and bright student who I believe has great potential to be an outstanding researcher in the area of computer architecture. His passion for the area is well-matched by his ability to absorb and apply new information.

During the Engineering Clinic project, James has always gone above and beyond what is expected from him. He is well versed in hardware design tools such as Verilog, Chipyard and chisel3. In particular, he has made significant contributions to the digital design of Digital Spiking Neuron (DSN) model. His thought process is clear and concise, which is a trait I came to value during our project discussions. As a part of his project related to the advanced computer architecture course, James worked on designing an application-specific co-processor for digital signal processing. It is worth noting that James worked independently during this time, and successfully overcame multiple obstacles to develop the hardware designs.

I strongly believe that James has the capability to contribute significantly to research projects in high performance computing and

computer architecture.

Applicant Rating

In comparison to other undergraduate students, please rate the applicant relative to his/her peers on the following qualifications:

	Do Not Know	Below Average	Average	Above Average	Superior
Analytical and Mathematical					X
Experimental Research					X
Overall Academic					X
Initiative and Self Reliance					X
Motivation toward Scientific Career					X
Originality of Thought					X
Emotional Maturity					X
Ability to Work with Others					X
Potential for Leadership					X
Oral Communication Skills					X
Written Communication Skills					X