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Personal Information

Biographical

Prefix	Mr.
First Name	Nihal
Last Name	Kumar
Sex	Male
Birthdate	07/25/2001
Birthplace	Jamshedpur, India

Contact

Email	nihalk17.iitkgp@gmail.com
Mobile	+91 99059 91993
Mailing Address	Flat no. 2/2, Sri Sai Apartment, Dindli Basti Adityapur Jamshedpur, IN-JH 831013 India
Permanent Address	Flat No. 2/2, Sri Sai Apartment, Dindli Basti Adityapur Jamshedpur, Jharkhand 831013 India

Citizenship

Citizenship Status	Foreign National
Primary Citizenship	India

Additional Information

How did you hear about us?	Internet Search
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Military Status

Are you currently serving or have you ever served in the United States Armed Forces?	No
Are you a dependent or spouse of a current or prior United States service member?	No

NC Residency

Do you claim to be a North Carolina Resident?	No. I do not claim North Carolina residency for tuition purposes. I understand I will be charged the non-resident tuition rate if enrolled at a North Carolina state-supported institution
Are you a first generation college student?	No

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Academic Program

Form Title Academic Program

ACADEMIC PROGRAM

Program/Major Computer Science
Degree/Delivery Method Master of Computer Science (MR) - On-Campus
Admit Term Fall 2025
Anticipated Attendance Status: Full Time

FINANCIAL AWARDS

Do you want to be considered for financial support? (i.e. Assistantships - Research or Teaching, and Fellowships) Yes
Did you play a varsity sport either at NC State or at another college or university? (Fellowships may be available) No
Have you applied to or are you receiving funding from another source? No

PREVIOUS NC STATE RECORDS

Have you ever applied for admission to our University (Undergraduate, Graduate, Agricultural Institute, Veterinary Medicine or Non-Degree Studies)? No
Have you ever been an enrolled student or employee at NC State University? No

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CSC Supplemental Information

Form Title	CSC Supplemental Information
	7.79
	10.0
Who is your primary CSC faculty member of interest?	Singh, Munindar
Who is your secondary CSC faculty member of interest?	Lester, James
CSC may share my contact information with graduate students currently in the program (required):	Yes
Please select a primary area of interest:	Artificial intelligence
Please select a secondary area of interest:	Data science & Analytics
Certification	I certify that my responses provided on this supplemental questionnaire are true and accurate. (required)

Undergraduate/Bachelor's Level #1

Institution	Indian Institute Of Technology - Kharagpur (IC0741)
Dates of Attendance	12/2020 - 05/2024
Location	Kharagpur, West Bengal, India
Primary Language is English	Yes
Degree	Bachelor, Other: 12/2020
Major	Civil Engineering
GPA	7.79 / 10
Awards	Gold Medalist at Inter-IIT Tech Meet 11.0
Please address any areas of concern regarding your education history (including areas of low performance)	<p>During my third year of undergraduate studies, I faced a significant setback when I was involved in a motorcycle accident. The incident left me with severe injuries that required extensive physiotherapy for nearly a year, during which I also missed several classes. Balancing academics with ongoing treatment was incredibly challenging, and my grades suffered as a result.</p> <p>Determined not to let the situation define my academic journey, I sought help from my peers, who generously shared their notes and spent time explaining complex concepts. My professors played an instrumental role in helping me catch up on missed topics by providing additional resources, guidance, and encouragement. I dedicated myself to catching up on missed topics, often staying up late into the night to bridge the gap in my understanding. Despite the physical and emotional toll, I gradually adapted to this new rhythm, learning resilience and time management along the way.</p> <p>While my grades were initially impacted, this period of hardship taught me the value of persistence, resourcefulness, and the importance of a supportive community. Eventually, I was able to recover fully, both academically and physically. I believe this turbulent time helped me develop significant mental resilience, making me stronger and more determined to embrace and overcome challenges in pursuit of my goals.</p>

Copy Test Scores

GRE

GRE
Verified Score
Date: 11/14/2024
Verbal: 149 (34%)
Quantitative: 170 (92%)
Analytical Writing: 4.0 (59%)

TOEFL

TOEFL-Internet-based Test (iBT)
Verified Score
Date: 11/16/2024
Total: 104
Listening: 27
Reading: 26
Writing: 28
Speaking: 23

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Community Standards

Form TitleCommunity Standards

CODE OF STUDENT CONDUCT

I agree to uphold the Code of Student Conduct

1. Excluding traffic infractions, have you ever been found guilty or convicted of a misdemeanor, felony, or other crime?

No

2. Excluding traffic violations, have you ever entered a plea of no contest, a plea of nolo contendere, or an Alford plea to a misdemeanor, felony, or other criminal charge; or received a deferred prosecution or prayer for judgment continued, for such a ch

No

3. Do you have any criminal charges pending against you?

No

4. Have you ever been found responsible for a disciplinary violation at any educational institution you have attended, related to behavioral misconduct that resulted in your long-term suspension, dismissal or being expelled?

No

5. If you have ever served in the U.S. military, did you receive any type of discharge other than an honorable, medical, or general discharge?

No - Never served

ATTESTATION

I have read and understand this information

Copy
Recommendations

Reference #1

Name	Dr. Pranab Kumar Dan
Organization	IIT Kharagpur
Title	Former Associate Professor
Relationship	Former Student
Phone	+91 99325 84480
Email	pkdan@see.iitkgp.ac.in
Name Displayed to Recommender	Nihal Kumar
Waiver	The Family Educational Rights and Privacy Act of 1974 (Buckley Amendment) allows you to access your educational records if you enroll at NC State. You may waive your right of access to this specific report if you so choose. Your decision to waive or not to waive your right of access will have no bearing on the handling of your application.
Waiver Response	I waive my right to access this report.
Waiver Signature	Nihal Kumar
Recommendation Requested	12/12/2024
Recommendation Submitted	12/13/2024

Reference #2

Name	Dr. Pabitra Mitra
Organization	IIT Kharagpur
Title	Professor
Relationship	Former Student
Phone	+1 919434724097
Email	pabitra@cse.iitkgp.ac.in
Name Displayed to Recommender	Nihal Kumar
Waiver	The Family Educational Rights and Privacy Act of 1974 (Buckley Amendment) allows you to access your educational records if you enroll at NC State. You may waive your right of access to this specific report if you so choose. Your decision to waive or not to waive your right of access will have no bearing on the handling of your application.
Waiver Response	I waive my right to access this report.
Waiver Signature	Nihal Kumar
Recommendation Requested	12/11/2024
Recommendation Submitted	12/11/2024

Reference #3

Name	Mr. Rakesh Sharma
Organization	University of Pennsylvania
Title	Research Fellow
Relationship	Ex Manager
Email	rakshrma@seas.upenn.edu

Name Displayed to Recommender	Nihal Kumar
Waiver	The Family Educational Rights and Privacy Act of 1974 (Buckley Amendment) allows you to access your educational records if you enroll at NC State. You may waive your right of access to this specific report if you so choose. Your decision to waive or not to waive your right of access will have no bearing on the handling of your application.
Waiver Response	I waive my right to access this report.
Waiver Signature	Nihal Kumar
Recommendation Requested	12/09/2024
Recommendation Submitted	12/10/2024

Certification

Signature

I certify that all information submitted in the admission process is my own work, factually true, and honestly presented. I understand that failure to provide complete, accurate, and truthful information in this application will be grounds to deny or withdraw my admission or dismiss me after enrollment.

Admission to NC State is contingent upon completion of any degree (bachelor's, masters, etc.) listed in your education history. If currently enrolled in a degree program, it is your responsibility to maintain a level of academic performance that meets university and program admission standards. Poor performance during your last semester(s) could jeopardize your admission. Failure to comply with these conditions could, at the discretion of the program or Graduate School, be grounds for changing the admission status.

I hereby acknowledge that the institution may verify the information listed in this application; and that the institution may divulge the contents of this application as permitted under the Family Educational Rights and Privacy Act of 1974 (FERPA) only if I am admitted AND I enroll at this institution.

Under Title IX of the Education Amendments of 1972, the university is committed to ensuring that every member of our community learns in an environment free of sex discrimination and sexual harassment. If you have experienced sex discrimination or sexual harassment, please contact NC State's Title IX Coordinator. Their contact information is:

Title IX Coordinator
231 Winslow Hall
Campus Box 7530
Raleigh, NC 27695
919.513.0574 (phone)
919.513.1428 (fax)title-ix-coordinator@ncsu.edu


I also hereby acknowledge that if I provided my US Social Security Number on my application, it was voluntary and with the understanding that it serves as consent for the University to use this data for student and alumni administrative and record-keeping purposes.

I understand that the application fee is non-refundable.


Nihal Kumar

Date

12/05/2024



INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR
STATEMENT OF GRADES OBTAINED FOR THE 8 SEMESTER COURSE IN ENGINEERING/TECHNOLOGY LEADING TO THE AWARD OF
BACHELOR OF TECHNOLOGY (HONOURS)



Roll No: 20CE10041
Course: B.Tech./Hons. in CIVIL ENGINEERING

Name: NIHAL KUMAR

Year of Admission : 2020-2021
Year of Graduation : 2023-2024

For Semester 1				For Semester 2				For Semester 3						
SGPA: 8.48				SGPA: 8.75				SGPA: 8.35						
Subno	Name	L-T-P	CRD	GRD	Subno	Name	L-T-P	CRD	GRD	Subno	Name	L-T-P	CRD	GRD
DIY1003	DIY PROJECT	0-0-3	2	A	BS1003	SCIENCE OF LIVING SYSTEMS	2-0-0	2	EX	CE20201	INTRODUCTION TO CIVIL ENGINEERING AND MATERIALS	3-0-0	3	A
EAI1007	EXTRA ACADEMIC ACTIVITY-I	0-0-3	1	EX	CE1003	ENGINEERING DRAWING AND COMPUTER GRAPHICS	1-0-3	3	B	CE20203	GEOMATICS	3-0-0	3	B
EET1003	ELECTRICAL TECHNOLOGY	3-1-0	4	B	CSI0003	PROGRAMMING AND DATA STRUCTURES	3-0-0	3	A	CE21201	SOLID MECHANICS	3-1-0	4	A
ENI9003	ENGINEERING LABORATORY	0-0-3	2	A	CSI9003	PROGRAMMING AND DATA STRUCTURES LABORATORY	0-0-3	2	A	CE22203	HYDRAULICS	3-1-0	4	B
EVI1003	ENVIRONMENTAL SCIENCE	2-0-0	2	A	CYI1003	CHEMISTRY	3-1-0	4	A	CE29203	HYDRAULIC AND WATER RESOURCES ENGINEERING LABORATORY	0-0-3	2	A
MA1003	ADVANCED CALCULUS	3-1-0	4	B	CYI9003	CHEMISTRY LABORATORY	0-0-3	2	EX	EAI10009	EXTRA ACADEMIC ACTIVITY-III	0-0-3	1	EX
ME1003	BASIC ENGINEERING MECHANICS	3-1-0	4	B	EAI10008	EXTRA ACADEMIC ACTIVITY-II	0-0-3	1	EX	EP21201	INTRODUCTION TO INNOVATION AND ENTREPRENEURSHIP	2-1-0	3	A
PH1003	PHYSICS OF WAVES	3-1-0	4	B	HS1003	ENGLISH FOR COMMUNICATION	2-0-2	3	A	MA20205	PROBABILITY AND STATISTICS	3-0-0	3	D
PHI9003	PHYSICS LABORATORY	0-0-3	2	EX	MA11004	LINEAR ALGEBRA, NUMERICAL AND COMPLEX ANALYSIS	3-1-0	4	C					

For Semester 4				For Semester 5				For Semester 6						
SGPA: 8.87				SGPA: 6.71				SGPA: 6.68						
Subno	Name	L-T-P	CRD	GRD	Subno	Name	L-T-P	CRD	GRD	Subno	Name	L-T-P	CRD	GRD
CE21202	STRUCTURAL ANALYSIS	3-1-0	4	C	CE30201	PAVEMENT ENGINEERING	3-0-0	3	D	CE30202	ANALYSIS AND DESIGN OF GEOTECHNICAL SYSTEMS	3-0-0	3	D
CE21204	TRANSPORTATION ENGINEERING	4-0-0	4	EX	CE30203	GEOTECHNICAL ENGINEERING	4-0-0	4	P	CE30204	WATER RESOURCES ENGINEERING	4-0-0	4	P
CE29202	GEOMATICS PRACTICE	0-0-3	2	A	CE30205	WATER AND WASTEWATER ENGINEERING	4-0-0	4	D	CE31004	DESIGN OF STEEL STRUCTURES	3-0-0	3	C
CE29204	TRANSPORTATION ENGINEERING LABORATORY	0-0-3	2	A	CE31001	DESIGN OF RC STRUCTURE	3-1-0	4	D	CE39201	STRUCTURAL MODELLING AND SIMULATION LABORATORY	0-0-3	2	C
EAI10010	EXTRA ACADEMIC ACTIVITY-IV	0-0-3	1	B	CE32201	MATHEMATICS STRUCTURAL ANALYSIS	2-0-2	3	A	CE39202	STRUCTURAL DESIGN SESSIONAL	0-0-6	4	C
EC21201	BASIC ELECTRONICS	3-1-0	4	A	CE39007	CONCRETE LABORATORY	0-0-3	2	B	CE39204	WATER RESOURCES AND GEOTECHNICAL ENGINEERING SESSIONAL	0-0-3	3	B
EC29201	BASIC ELECTRONICS LABORATORY	0-0-3	2	EX	CE39011	W & W.W. ENGINEERING LABORATORY	0-0-3	2	B	CE60202	ENVIRONMENTAL IMPACT ASSESSMENT	3-0-0	3	D
HS21201	ECONOMICS	3-1-0	4	A	CE39203	GEOTECHNICAL ENGINEERING LABORATORY	0-0-3	2	B	CE60222	COASTAL HYDRODYNAMICS	3-0-0	3	B

For Semester 7				For Semester 8					
SGPA: 6.73				SGPA: 7.20					
Subno	Name	L-T-P	CRD	GRD	Subno	Name	L-T-P	CRD	GRD
CE47005	PROJECT-I	0-0-6	4	C	CE47006	PROJECT-II	0-0-9	6	C
CE48201	SUMMER INTERNSHIP	0-0-0	2	B	CE60019	ROCK MECHANICS AND TUNNELLING	3-0-0	3	D
CE60016	PAVEMENT ASSET MANAGEMENT FOR ROADS, AIRPORTS AND PORTS	3-0-0	3	C	EP60042	ENGINEERING DESIGN PROCESS	3-0-0	3	A
CE60125	NUMERICAL METHODS IN STRUCTURAL ENGINEERING	3-0-0	3	D	HS60084	URBAN SOCIOLOGY	3-0-0	3	C
EP60025	SPECIAL TOPICS IN ENTREPRENEURSHIP	2-1-0	3	D					

Details of additional subjects
Subno Name L-T-P CRD Sumo CRD
MA30014 OPERATION RESEARCH 3-0-0 3 4 EX
Total Additional Credits Taken: 3
GPA in Additional Subjects: 10.00
Total Additional Credits Cleared: 3

Total Credits Taken in Major Curriculum: 174
Total Credits Cleared: 174
CGPA: 7.79

Checked by Senior Executive (Academic):
Date of Issue: 12 July 2024

Joint Registrar (Academic):
Digitally signed by Biswajit Bhattacharyya
Date: 2024.07.12 15:14:55 +05:30

INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR



Statement of Academic Performance

of

NIHAL KUMAR

Four Year Programme in

BACHELOR OF TECHNOLOGY (HONOURS)

GENERAL INFORMATION

1. Abbreviations used in the grade card stands for:
LTP = Lecture, Tutorial, Practical; figures shown under this column indicate weekly contact hours prescribed for the Subject
CRD = Credit carried by the Subject
GRD = Grade obtained by student in the Subject
CGPA = Cumulative Grade Point Average
SGPA = Semester Grade Point Average
GPA = Grade Point Average

2. English is the medium of instruction at all levels.
3. Extra Academic Activity (EAA) subjects include NCC, NSS and NSO, NCA.
4. The seven-point letter grade system followed by the institute in assessing student's performance in a subject is as follows:

Performance	Letter Grade	Grade Point Value Per Credit
Excellent	EX	10
Very Good	A	9
Good	B	8
Fair	C	7
Average	D	6
Pass	P	5

5. Highest possible CGPA in the system is 10.00. No rank or class or division is awarded. The CGPA may be multiplied by a factor of 10 to obtain the numerical percentage for those students who have graduated in 2020-2021 or earlier.
The Conversion formula to be effective for all students from the graduation year 2021-2022 is as follows:
Percentage of Marks=(20/7)*{(4*x)-5}, [where, x is CGPA]
6. (I) A student is awarded a B.Tech. (Hons.); B.Arch. (Hons.); Dual Degree for B.Tech. (Hons.) & M.Tech.; Integrated B.Sc. (Hons.) and M.Sc.; Integrated B.Sc. (Hons.) and M.Sc. & M. Tech.; 4 Yrs. B.S.; 2 Yrs. or 3 Yrs. M.Sc. on completion of the curricular requirement with a minimum CGPA of 6.00.
(II) The credits and grades obtained in additional subjects optionally taken by a student on satisfying the prescribed conditions do not contribute towards the CGPA.
(III) The CGPA obtained by a student in additional subjects is computed separately. For the award of MINOR degree in a particular discipline, the credits and grades of the additional and other subjects that are taken into account are separately indicated along with the computed GPA.
(IV) Minimum GPA for a Minor in any discipline is 6.00.
7. Duration of Course
Minimum duration of the B.Tech. (Hons.); B.Arch. (Hons.); Dual Degree for B.Tech. (Hons.) & M.Tech. (or MBA); Integrated B.Sc. (Hons.) and M.Sc.; Integrated B.Sc. (Hons.) and M.Sc. & M. Tech.; B.S. and M.Sc. degree is given on the front cover page.
However, with the approval of the Senate a slow paced student may take more semesters to complete the degree requirements.

Statement of PurposeNihal Kumar

My undergraduate years have been profoundly shaped by various projects and internship experiences that have broadened my view of technology's potential. Working on healthcare and urban planning projects, I realized that data science isn't just an exciting technological frontier; it's a vital tool for societal progress. I experienced this epiphany during an introductory course project in my second semester at IIT Kharagpur, where I applied time-series forecasting to analyze catfish sales data. I was impressed by how data science not only predicted outcomes but also optimized business operations. To further fuel my curiosity, I undertook specialized MOOCs and actively engaged in discussions with experienced peers which significantly expanded my knowledge and skills, deepening my appreciation for AI's vast potential. Each project I participated in and every discussion I engaged in solidified my resolve to fully explore the extensive capabilities of AI.

The summer break of 2022, however, served as the catalyst for my data science journey. At IIT Delhi, under the mentorship of Prof. Souvik Chakraborty, I worked on a research project where I created a conditional generative adversarial network (GAN) to generate optimized layer patterns for auxetic metamaterials, enhancing their mechanical properties. This project was a crucial milestone in my data science exploration, introducing me to the realm of generative models and advanced design techniques. In an effort to make the most of my summer break, I secured an internship with Tata Elxsi Limited, where I addressed the complex challenge of track alignment and rail discontinuity detection in railway systems. Utilizing super-resolution techniques, I contributed toward significantly improving image quality and deployed advanced models such as YOLO, VGG, and ConvNet to analyze track images, thereby enhancing the real-time monitoring systems. These engagements not only honed my technical skills but also helped me understand how data science and AI contribute to safeguarding and improving the systems upon which society relies.

Having solidified my foundation, I was eager to explore more advanced frontiers in the ever-evolving space of data science and AI. This brought me to Siemens Technology and Services, where I worked on generating novel 3D views of objects using radiance field networks like NeRF, CodeNeRF, and ShaRF for urban planning and traffic management. Here, a key challenge was to ensure consistent and accurate views, especially due to the lack of relevant datasets. To tackle this, I wrote custom scripts to generate tailored datasets and enhanced the quality and realism of images using GANs for real-world adaptation. Despite progress in overcoming these challenges, I found it difficult to maintain view consistency under varying lighting and angles, revealing gaps in my understanding of multi-view learning and image translation. Through this project, I gained insight into the complexity of real-world data and realized that data science goes beyond applying algorithms; it's about addressing uncertainty and nuances to create meaningful solutions.

This shift in perspective further took shape when I joined a research project with Prof. Pascal Geldsetzer at Stanford University, a defining experience that showed me the transformative power of data science in solving critical global issues. Our project aimed to estimate crucial maternal and child health indicators in low and middle-income countries using machine learning and geo-tagged satellite imagery. This project was particularly challenging due to the sheer volume of the dataset, which included over 1.4 billion entries. By using techniques like XGBoost, LightGBM, and KNN, I contributed to a significant improvement in predictive accuracy for key healthcare indicators, ensured wide-scale applicability in over 50 countries, and helped eradicate the need for expensive health surveys. The complexity and potential impact of the healthcare domain deeply intrigued me. I was fortunate to further explore this field through my work with Eli Lilly and Company. At Lilly, I worked on a project focused on quantifying the physiological effects of drugs such as edema and erythema. By optimizing medical image processing workflows, our team achieved a 97% reduction in analysis time, significantly accelerating clinical diagnostics. My experience in this domain showed me the transformative power of data in influencing human lives and taught me that data is not merely a resource but a responsibility.

Statement of Purpose

Nihal Kumar

In light of these experiences, it was only natural for me to choose a data science-based research topic for my final year project. I had the opportunity to work under the guidance of Prof. Pabitra Mitra, where I refined the Causal and Spatial-constrained Long and Short-term Learners (CSLSSL) model to improve accuracy in predicting human mobility patterns while ensuring privacy compliance. This effort aimed to improve urban planning and transportation management, contributing to the development of smarter and more sustainable cities. However, the model's key limitation was its inability to generalize across different urban environments, highlighting the need to develop more robust and adaptable models for diverse, real-world scenarios—an area I aim to explore comprehensively through a graduate program in data science.





I am currently a Software Engineer II at Trimble Inc., where I focus on AI-driven product development. My work includes enhancing Florence-2's zero-shot learning capabilities and accuracy by fine-tuning it on tailored datasets optimized for spatial hierarchy and semantic granularity. Another significant project involves automating Q&A dataset creation from PDFs to refine large language models like GPT-4o for detailed user-specific responses and scene comprehension. During this project, I faced challenges such as the model's inability to answer multi-layered questions and the difficulty of generalizing large vision models at scale—where controlled successes often struggled to translate into real-world, large-scale datasets. These experiences have driven me to seek deeper expertise in data science to address these challenges and push the boundaries of what AI models can achieve.

Through my internships, research projects, and current role, I have adopted a multimodal approach, working with text, image, and tabular data. However, I feel that I still need a stronger theoretical grounding to make a larger impact on large-scale systems. While my undergraduate education has been in civil engineering, my journey in data science and AI has been driven by personal curiosity and an ambition to tackle practical challenges with data. Given my interests and aspirations, I think the Master of Computer Science program with a Data Science track at North Carolina State University is tailor-made for me, distinguished by its emphasis on interdisciplinary learning and its pioneering research in data science. The curriculum of *CSC 722: Advanced Topics in Machine Learning* aligns with my goals and will provide me with skills in advanced learning methods, including theories of learnability and evaluation strategies, essential for building scalable and adaptable AI models. Furthermore, I'm eager to learn methods for extracting actionable insights from data while addressing privacy and security concerns by taking up the coursework on *CSC 522: Automated Learning and Data Analysis*. I am particularly looking forward to an opportunity to work with Professor Munindar P. Singh, whose research on developing ethical and cooperative multiagent systems aligns with my current work in creating a customizable agent marketplace to address diverse human needs. Additionally, I am eager to interact and learn from Dr. James C. Lester to better understand narrative-centered learning environments and the development of AI-driven educational tools through his work at the NSF AI Institute for Engaged Learning.

After graduation, I plan to work at leading firms like Merative or Sidewalk Labs, where I can leverage the skills and knowledge I've gained to navigate and solve complex challenges. In the long term, I aspire to lead initiatives focused on developing scalable AI solutions while contributing to impactful research that serves both people and innovation. I am confident that the resources and expertise available at North Carolina State University will help me achieve my long-term goals and make a significant contribution to the field. That being said, I am equally certain that I have what it takes to join and complete this challenging graduate program with distinction and contribute to its vibrant academic community. I look forward to this transformative journey that awaits me.

NIHAL KUMAR

Jamshedpur, Jharkhand, India

 +91-9905991993  nihalk17.iitkgp@gmail.com  linkedin.com/in/nihalk17  nihalk17.github.io

Education

Indian Institute of Technology, Kharagpur

Dec 2020 – May 2024

Bachelor of Technology (Honours) in Civil Engineering, CGPA: 7.79/10

Kharagpur, West Bengal

Achievements: Ranked **top 0.5%** in JEE 2020 among **1.2M** candidates, **Gold Medalist** at Inter-IIT Tech Meet 11.0**Activities:** National Service Scheme Volunteer, Undergraduate Student Mentor, Basketball Player, Quiz Club Member

Work Experience

Software Engineer II | Trimble Inc.

Jun 2024 – Present

- Enhanced zero-shot learning and accuracy by fine-tuning **Florence-2** on tailored datasets for spatial and semantic traits
- Automated Q&A datasets from PDFs to refine LLMs like **GPT-4o** for user-specific responses and scene comprehension
- Selected as the **youngest speaker** to present my paper on VLM and LLM advancements at the Trimble tech conference
- Led an AI club, facilitated collaboration through meetups, and created a live Q&A and feedback app for company events
- Building a customizable agent marketplace for streamlined, cost-effective pipelines with minimal software requirements

Internships

Data Science Intern | Eli Lilly and Company

Jun 2023 – Aug 2023

- Developed scripts to automate and streamline complex medical analysis processes, creating a unified, efficient pipeline
- Automated Edema and Erythema quantification; used **Lua** for **3D** image processing and Python for managing metadata
- Unified processes into a single script with **ImageJ** gateway integration, achieving a **97.4%** reduction in processing time

Research Intern | SIEMENS Technology and Services Pvt. Ltd.

Jun 2022 – Aug 2022

- Generated novel views of real-world objects from images using deep learning networks for enhanced **3D** representation
- Researched radiance field networks and applied NeRF, CodeNeRF, and ShaRF on custom datasets of over **4,700** images
- Produced views that aided in evaluating traffic scenarios in Bangalore and Pune, providing insights for urban planning

Data Science Intern | TATA Elxsi Limited

Apr 2022 – Jun 2022

- Innovated techniques to enhance railway safety using computer vision and deep learning for potential hazard detection
- Employed models like YOLO, VGG, and ConvNet and used methods like super-resolution and segmentation for analysis
- Analyzed over **14,000** images by utilizing networks like SinGAN and SRGAN, and enhancing video content via FFmpeg

Research Projects

Indian Institute of Technology, Kharagpur | Prof. Pabitra Mitra

Aug 2023 – Apr 2024

- Built a framework using Deep Causal Generative Models to synthesize human mobility data, supporting urban planning
- Applied models like SVAEs and CSLSLs on the GeoLife dataset, with preprocessing for quality and privacy-compliance
- Produced realistic mobility data, boosting model accuracy and robustness, and offering valuable urban planning insights

Stanford University, USA | Prof. Pascal Geldsetzer

May 2023 – Jul 2023

- Developed a ML model to assess health in low- and middle-income countries using satellite imagery and geotagged data
- Managed **1.44 billion** data points from Google Earth Engine and DHS, converting them to Parquet format for efficiency
- Achieved a mean RMSE of **14.71** with KNN, XGBoost, and LightGBM, establishing a benchmark for health indicators

Indian Institute of Technology, Delhi | Prof. Souvik Chakraborty

Apr 2022 – Jul 2022

- Developed methods to create patterns with superficial properties from auxetic metamaterial layers for enhanced design
- Built a conditional GAN for layer patterns and applied Voronoi tessellation to generate over **2500** discrete cell patterns
- Generated patterns with enhanced superficial properties, enabling the design of structures tailored to user specifications

Technical Skills

Programming Languages: Python, C, C++, SQL, Lua, MATLAB**Libraries:** NumPy, Pandas, Matplotlib, Scikit-Learn, Keras, PyTorch, TensorFlow, Transformers, FastAPI, OpenCV**Miscellaneous:** Jupyter Notebooks, Git, MySQL, Vectra, Azure, Arduino, CUDA

Leadership

Associate Manager | Entrepreneurship Cell, IIT Kharagpur

May 2021 – Jul 2022

- Led a team of **74** members to promote entrepreneurship across resource-constrained cities, impacting over **30k** students
- Facilitated grants totaling **INR 12 Mn+** and mentoring for **20+** startups to help them innovate and expand operations
- Organized India's 1st carbon neutral E-Summit that saw the participation of over **7k** startups, professionals and investors

Founding Team Member | ROGAN - a SaaS-based startup

Mar 2021 – Aug 2021

- Partnered with **15+** salons during a **3-month** pilot to test the solution's viability, resulting in **20%** increase in footfall
- Boosted user retention by **28%**, optimizing app features based on data insights from A/B tests and interaction analytics