

# INDRAJIT PAL

[Personal Website](#) | [LinkedIn](#) | [GitHub](#) | [Email](#)

## EDUCATION

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### Bachelor of Engineering, Electronics and Communication Engineering

Birla Institute of Technology, Mesra, Ranchi, India

CGPA: 8.11/10

First Class with Distinction

### Higher Secondary (Class 12), Central Board of Secondary Education (CBSE)

All India Senior School Secondary Examination

Delhi Public School, Ruby Park, Kolkata, India

94.6%

### Secondary (Class 10), Central Board of Secondary Education (CBSE)

All India School Secondary Examination

Delhi Public School, Ruby Park, Kolkata, India

95% (A1)

(Secured highest possible A1 grade in all 5 major subjects)

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## WORK EXPERIENCE

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### Senior Data Scientist (August 2021 – Present)

[Noodle.ai](#) | Location - Bangalore, India

[Noodle.ai](#) is an Artificial Intelligence startup specializing in building machine learning applications for enterprises to reduce industrial waste.

#### Role Synopsis

- Building predictive Sequential / Time Series Forecasting machine learning models which generate Demand-Supply recommendations to limit waste, enable efficient distribution of inventory in disrupted supply chains.
- Developing Noodle's Proprietary AI algorithms (ML/RL) for flagship "Supply Chain AI" product suite – [Demand Flow](#) | [Inventory Flow](#) to optimize Digital Supply Chains, driving revenue over \$1 Million/month.
- Improved efficiency in AI Deployment Pipelines by increasing development & deployment speeds by 3× times with trained AI models which outperforms baseline SAP's projections by **more than 20%** wMAPE.

### Machine Learning Engineer (July, 2018 – July 2021)

Business Intelligence Unit, Axis Bank | Location - Bangalore, India

#### Role Synopsis

- Developed machine learning models in Python (*scikit-learn*, *Spark MLlib*, *TensorFlow*, *Keras*) to predict credit-risk, customer churn & customer-behavioral scores for different Banking products.
  - Created APIs & data pipelines for extracting, analyzing model features in big-data, distributed computing platforms using Spark.
  - Enabled data-driven decision-making by deploying ML models in real-time through REST (*RESTful*) APIs & *Docker* containers which generates value of close to Rs. 2.5 crores & limits costs to organization.
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## PROJECTS AND RESEARCH PUBLICATIONS

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Complete collection of – My projects: [here](#) | My Research publications: [here](#)

### Gamified Reinforcement Learning with Interactive AI Agents

Project Webpage: <https://indropal.github.io/AIArcade/> | [\[Link\]](#)

- Explored Reinforcement Learning (RL) Algorithms (like *PPO*, *Q-Learning*) & built *RL AI Agents* to interact with users in real-time.
- Deployed interactive-environment with trained RL Agents to interact with users in real-time which is easily accessible via [web-browser](#).

### Intercorrelation of Major DNA/RNA Sequence Descriptors – A Preliminary Study

Journal: *Current computer-aided drug design*, Volume 12, Number 3, 2016, pp. 216-228(13)

Authors: Dwaipayan Sen, Subhadeep Dasgupta, **Indrajit Pal**, S. Manna, C. Basak, G.D. Grunwald | DOI: [10.2174/1573409912666160525111918](https://doi.org/10.2174/1573409912666160525111918)

Link: <https://www.ingentaconnect.com/content/ben/cad/2016/00000012/00000003/art00005>

- Various techniques for Graphical Representation & Numerical Characterization (*GRANCH*) of DNA/RNA sequences have been explored & their relative efficacies in clustering molecular sequences based on unique sequence descriptors which encode non-redundant structural information have been assessed.
- Observations through *Principal-Component-Analyses* along with a broad study in correlation of calculated DNA-descriptors among various techniques suggests strong inter-correlation & redundancy in structural information among some techniques.

### Generative Deep Learning with Multiple Modalities

GitHub Repository: <https://github.com/indropal/GenerativeDeepLearningwithMultimodality> | [\[Link\]](#)

- Explored State-Of-The-Art architectures in Generative Deep Learning like *CLIP* & *VOGAN*.
- Developed a *Text-to-Image* Deep Learning (DL) architecture which can generatively create images from contextual information in text.
- The developed DL architecture is capable of producing artistic styling like [Sfumato](#).

### Circuit-Level Technique to Design Variation and Noise-Aware Reliable Dynamic Logic Gates

Journal: *IEEE Transactions on Device and Materials Reliability*, vol. 18, no. 2, pp. 224-239, June 2018

Authors: **Indrajit Pal**, Aminul Islam | DOI: [10.1109/TDMR.2018.2819019](https://doi.org/10.1109/TDMR.2018.2819019)

Link: <https://ieeexplore.ieee.org/document/8323211>

- Proposed novel circuit-level approach to mitigate delay variations due to *Process/Voltage/Temperature (PVT)* fluctuations – improving *PVT* robustness with **50% reduction** in delay variability & enhancing noise immunity for near-threshold operation of Dynamic logic gates.
- Developed theoretical model of proposed Dynamic logic topologies and performed extensive robustness study by Monte Carlo simulations in HSPICE

## A VDTA-based robust electronically tunable memristor emulator circuit

**Journal:** *Analog Integrated Circuits and Signal Processing*, 2019

Authors: **Indrajit Pal**, Vikash Kumar, Nilay Aishwarya, Abhijeet Nayak, Aminul Islam | DOI: [10.1007/s10470-019-01575-y](https://doi.org/10.1007/s10470-019-01575-y)

Link: <https://doi.org/10.1007/s10470-019-01575-y>

- Designed a *Voltage Differencing Transconductance Amplifier (VDTA)* - based memristor emulator with tunable memristive properties & derived a mathematical model of the circuit which is robust to PVT fluctuations.
- The designed circuit can be integrated into *ASICs* designed for ML Applications & On-Chip Learning - the results of a practical on-chip implementation have been demonstrated along with its transfer-characteristics and presented in the manuscript.

## Electronic Toll Collection System using Barcode Technology

**Conference:** *Springer Sponsored Conference on Nanoelectronics, Circuits and Communication Systems*, 2017

Authors: E.V.V. Hari Charan, **Indrajit Pal**, Akash Sinha, Raj Kamal Roye Baro, Vijay Nath | DOI: [10.1007/978-981-13-0776-8\\_51](https://doi.org/10.1007/978-981-13-0776-8_51)

**Published Book Series:** *Springer Book Series – Lecture Notes in Electrical Engineering*

- An automated Electronic Toll Collection was developed with the capability of decoding information in barcodes via sophisticated image-processing (*using OpenCV*) techniques & fast retrieval of information from a database using the decoded data

## Predicting Bio-Molecular properties from Molecule Structure

**GitHub Repository:** <https://github.com/indropal/GraphDLBioMolecules> | [\[Link\]](#)

- Graphs are an efficient way to represent molecular structure and to understand the interactive bonds amongst atoms – which can be further used to decipher a molecule’s physical properties.
- This project explores *Graph Neural Networks* to decipher graph representations of bio-molecular structures & predict physical-properties of molecules.

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## SKILLS

Skill Type	Details
<i>Programming Languages</i>	Python, C/C++, C#, JavaScript
<i>Machine Learning Libraries</i>	scikit-learn, XGBoost, CatBoost, LightGBM, SciPy
<i>Deep Learning Frameworks</i>	TensorFlow, Keras, PyTorch
<i>Big Data Frameworks</i>	Spark/PySpark, Hive
<i>Deployment Frameworks</i>	Docker, Flask
<i>Project Management Software</i>	JIRA, git

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## TECHNICAL CERTIFICATIONS

### Deep Learning Specialization

DeepLearning.AI, Coursera | [\[ Specialization Certificate Link \]](#)

### DeepLearning.AI TensorFlow Developer Professional Certificate

DeepLearning.AI, Coursera | [\[ Professional Certificate Link \]](#)

### Applied Machine Learning in Python

University of Michigan, Coursera | [\[ Certificate Link \]](#)

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## PERSONAL DETAILS

<i>Personal Website:</i>	<a href="https://indropal.github.io">https://indropal.github.io</a>		<a href="#">[Link]</a>
<i>LinkedIn profile:</i>	<a href="https://linkedin.com/in/pal-indrajit">https://linkedin.com/in/pal-indrajit</a>		<a href="#">[Link]</a>
<i>GitHub Profile:</i>	<a href="https://github.com/indropal">https://github.com/indropal</a>		<a href="#">[Link]</a>
<i>Google Scholar Profile:</i>	<a href="https://scholar.google.com/citations?hl=en&amp;user=NUn9s9YAAAAJ">https://scholar.google.com/citations?hl=en&amp;user=NUn9s9YAAAAJ</a>		<a href="#">[Link]</a>
<i>Email ID:</i>	<a href="mailto:pal.indrajit99@gmail.com">pal.indrajit99@gmail.com</a>		

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