From Engineering Students to AI Research Leaders: India's Path Forward

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Neural Nurture

Contents

What You'll Take Away Today

Your Transformation Journey

- **Mindset Shift:** From problem-solver to problem-finder
- **Clear Roadmap:** 4-year journey to become an AI researcher
- **Practical Steps:** What to do starting this week
- **Inspiration:** How you can lead India's AI revolution
- **Community:** Support systems to help you succeed

About Your Guide Today

Vijay Daultani

CEO @ Neural Nurture

- 2006 - 2010 B.E @ Truba
- 2010 - 2011 Associate Software Engineer @ Accenture
- 2012 - 2014 M.Tech @ IIT Delhi
- 2014 - 2017 Researcher SX-ACE @ NEC
- 2015 Visiting Scholar @ UC Berkeley
- 2017 - 2019 Assistant Manager NLP @ Rakuten
- 2019 - 2021 Sr. TPM Applied ML @ Amazon
- 2021 - 2025 PhD @ Tokyo Institute of Technology
- 2021 - 2023 Group Manager NLP @ Rakuten
- 2025 - Present CEO @ Neural Nurture

Introduction

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Welcome to this transformative discussion

- Your guide today: An AI researcher passionate about India's tech future

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Let's shape the future of AI research in India

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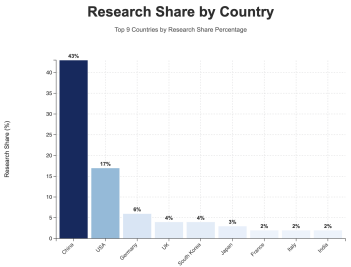
5. Your future career will demand skills that can't be Googled
   - Critical thinking, problem-finding, and original contribution are the real differentiators

The Global AI Research Landscape



Global AI Research Output

Share of AI Publications by Country
Source: Nature Index, Physical Sciences
Date: May 2024 - April 2025

- China: 43% of all AI research output — almost 1 out of every 2 papers worldwide
- USA: 17% — about 1 in every 6 papers, less than half of China's share
- India: 2% — around 1 in every 50 papers, but with massive growth potential

Where will you fit in this picture 4 years from now?

India's Opportunity

We have the talent, momentum, and timing — what's missing is the leap from doing work to leading research

Mindset Shift: From Engineer to Researcher

Engineering vs Research Mindset

Engineering

- Focus on known problems

Research

- Explore unknown territories

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- Novel evaluation methods
- *"What problems don't we know how to solve yet?"*

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- *"What problems don't we know how to solve yet?"*

Both mindsets are valuable - research adds the discovery element

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Research is more accessible than you think

What Makes an AI Researcher?

Asking “What If?” Questions

Learning from Failures

Tackling Complex Problems

Sharing Discoveries

These are learnable skills, not innate talents

The Four-Year Roadmap

Your 4-Year Research Journey

Each year builds on the previous

- **Year 1:** Build foundations + start reading research papers

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- **Year 1:** Build foundations + start reading research papers
- **Year 2:** Try reproducing research + join projects
- **Year 3:** Conduct independent research + present findings
- **Year 4:** Original contribution + decide next steps

Year 1 - Building Your Foundation

- **Focus:** Learn to read and understand research
- **Action items:**
  - Master core math: linear algebra, statistics, optimization
  - Read 1 research paper per week (start simple!)
  - Join study groups and research discussions

Outcome: You can explain current AI research to others

Year 2 - Getting Your Hands Dirty

- **Focus:** Experience research through replication
- **Action items:**
  - Pick 2-3 interesting papers and implement them
  - Join a research project (even as a helper)
  - Start building a portfolio of experiments

Outcome: You understand how research actually works

Year 3 - Finding Your Voice

- **Focus:** Develop your own research questions
- **Action items:**
  - Identify problems that interest you
  - Design and run your own experiments
  - Present your work at student conferences

Outcome: You can formulate and investigate new ideas

Year 4 - Making Your Mark

- **Focus:** Original research contribution
- **Action items:**
  - Complete a significant research project
  - Submit to conferences or journals
  - Mentor junior students

Outcome: You're ready for graduate school or research roles

Opportunities & Areas to Contribute to AI Research

Research Areas Where India Can Lead

- **Multilingual AI:** Leveraging India's 22+ official languages
- **Agricultural AI:** Rural technology solutions
- **Healthcare AI:** Optimizing for resource constraints
- **Educational Technology:** Solutions that scale
- **Climate Solutions:** Environmental challenges

Solve problems that matter to India and the world

Essential Skills You'll Develop

- **Technical:**
  - Programming, mathematics, statistics, ML/AI
- **Research:**
  - Problem formulation, experimental design, analysis
- **Communication:**
  - Writing papers, giving talks, collaboration
- **Critical thinking:**
  - Evaluating claims, identifying limitations

These skills transfer beyond just AI research

Your Research Toolkit

- **Programming:**
  - Python, PyTorch/TensorFlow, Jupyter notebooks
- **Reading:**
  - Google Scholar, arXiv, research papers
- **Writing:**
  - LaTeX, research notebooks, documentation
- **Collaboration:**
  - Git, research groups, conferences

Start building familiarity with these tools early

Taking Action Now

How to Get Started Right Now

- **This semester:**
  - Subscribe to AI newsletters (The Batch, AI Research)
  - Follow researchers on social media
  - Attend online talks and webinars
  - Join AI/ML communities and forums
- **This year:**
  - Find a research mentor (faculty or senior student)
  - Join or start a research reading group
  - Participate in competitions (Kaggle, research challenges)

Support Systems Available

- **Academic:** Faculty mentors, research groups, lab access
- **Peer:** Study groups, student research communities
- **Online:** MOOCs, research papers, coding platforms
- **Institutional:** Library resources, conference funding, scholarships

You don't have to do this alone

Impact & Closing

Your Impact Potential

- **Personal:** Develop career-long skills
- **Local:** Solve problems relevant to Indian communities
- **Global:** Contribute to human knowledge and AI progress
- **Future:** Help train the next generation of researchers

Your research creates ripples of impact

Your Journey Starts Today

**Research is not something you do later -
it's something you grow into**

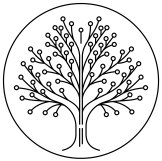
Every expert was once a beginner

India needs your fresh perspective and energy

Welcome to your research journey!

Thank You

Neural Nurture



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