

# Rajendra Choudhary

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I have completed my *Ph.D.* in Computer Science & Engineering from IIT Indore (India), under the supervision of Dr. Kapil Ahuja. Earlier, I completed my M.Tech. (in Robotics) under the supervision of Prof. Ramji Lal and Dr. Pavan Chakraborty from IIIT Allahabad (India).

## Research Interests

I work at the intersection of Computer Science and Mathematics to solve engineering problems. Specifically, I have research interests as follows: Theory of Computation, Algorithms, Optimization, Numerical Linear Algebra, and Group Theory. Apart from these, I would also like to advance my understanding of the peridynamics theory.

## Education

Jan 2014 - Oct 2019	<b>Doctor of Philosophy (Ph.D.), Computer Science &amp; Engineering</b> Indian Institute of Technology Indore, Indore, India  CPI: 8.50 / 10.00 Advisor: Dr. Kapil Ahuja Dissertation: Stability Analysis of Inexact Linear Solves in Model Order Reduction
July 2011 – July 2013	<b>Master of Technology (M.Tech.), IT (Robotics)</b> Indian Institute of Information Technology Allahabad, India  CGPI: 7.60 / 10.00 Advisor: Prof. Ramji Lal & Dr. Pavan Chakraborty Thesis: Theoretical Aspect of Transformation Using Group Theory
July 2006 – Jun 2010	<b>Bachelor of Engineering (B.E.), Computer Science &amp; Engineering</b> Shri Vaishnav Institute of Technology & Science, Indore, India (RGPV University)  Percentage: 63.16 / 100.00 Advisor: Dr. Rajesh Chakraborty Project: Text Based Image Retrieval System.

## Technical Skills:

Programming Languages	C, C++, .NET, PYTHON.
Tools	Matlab, Octave, IBM DB2, IBM RAD, NetBeans.

## Professional Experience

Jan 2014 - Oct 2019

### Graduate Research/Teaching Assistant

*Department of Computer Science & Engineering, IIT Indore, India*

- Researched on Stability Analysis of Inexact Linear Solves for Model Order Reduction.
- Studied both Non-Parametric and Parametric Systems.
- TA for four courses in five consecutive semesters.

Sept 2016 - Oct 2016

### Research Internship

*Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg, Germany*

- Worked on a project title “Model Reduction of (Quadratic-)Bilinear Systems” under the supervision of Prof. Peter Benner.

July 2011 – July 2013

### Graduate Research/Teaching Assistant

*Department of Information Technology, IIT Allahabad, India*

- Researched on transformation theory of robotics arm and its manipulator at AI & ROBOTICS Lab, IIT Allahabad.
- TA for four courses in four consecutive semesters.

## Journal Publications

### *Published*

- **R. Choudhary** and K. Ahuja, Inexact Linear Solves in Model Reduction of Bilinear Dynamical Systems”, IEEE ACCESS, vol. 7, pp. 72297-72307, 2019.
- **R. Choudhary** and K. Ahuja, Stability Analysis of Bilinear Iterative Rational Krylov Algorithm. *Linear Algebra and its Applications (Elsevier Journal)*, vol. 538, pp. 56–88, 2018.

### *Under Preparation*

- **R. Choudhary** and K. Ahuja, A Note on Stability Analysis of Inexact Linear Solves in Parametric Model Order Reduction.

## Research Talks

- Stability Analysis of Bilinear Iterative Rational Krylov Algorithm. *Reduced Basis Summer School-2016*, Hedersleben, Germany, Oct 4-7, 2016,  
and  
*International Conference on Mathematical Modelling, Differential Equations, Scientific Computing & Applications (ICMMDESCA-2016)*, IAMMS, IIT Kanpur, India, Mar 27-29, 2016.

## Posters

- Stability Analysis of Iterative Linear Solves in Truncated Bilinear Iterative Rational Krylov Algorithm”, *2nd Cyber-Physical Systems Symposium (CyPhySS)*, Indian Institute of Science Bangalore, July 11-12, 2018.
- Recycling Krylov Subspaces for Model Reduction on GPUs, *International Undergraduate Research Symposium (IURS-10)*, Wilmington College, USA, May 14-20, 2017 (presented by Mr. Ruchir Garg, an undergraduate student).
- Stability of Linear Solves in Multipoint Volterra Series Interpolatory Bilinear Model Reduction, *Industry Academia Conclave-2016 (IAC-2016)*, IIT Indore, Feb 18-20, 2016,  
and  
*Ramanujan Conclave-2015*, IIT Indore, Dec 22-23, 2015.

## Teaching Assistant @ IIT Indore

1 <sup>st</sup> semester	Embedded Systems (CS 420 / CS 620)
2 <sup>nd</sup> semester	Discrete Mathematical Structures (CS 201)
3 <sup>rd</sup> semester	Numerical Simulation (CS 422 / CS 622)
4 <sup>th</sup> semester	Discrete Mathematical Structures (CS 201)
5 <sup>th</sup> semester	Automata Theory and Logic (CS 202)

## Teaching Assistant @ IIIT Allahabad

1 <sup>st</sup> semester	Introduction to Programming (ITP 102)
2 <sup>nd</sup> semester	Data Structures (DST 232)
3 <sup>rd</sup> semester	Design and Analysis of Algorithms (DAA 432)
4 <sup>th</sup> semester	Graphics & Visual Computing (GVC 532)

## Certification

2009	IBM DB-2, IBM RAD, IBM Rational Rose Certified.
2008	Got the 4 <sup>th</sup> position in ”The Great Mind Challenge - IBM Academic Initiative” at SVITS Indore.

## Service

### Conferences and Workshop

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|------|---|
| 2017 | Volunteer for <i>Second IIT Indore-TU9 Research Workshop</i> , hosted by IIT Indore.  |
| 2017 | Volunteer for <i>French Admissions Tour</i> organized by French Embassy, hosted by IIT Indore.  |
| 2016 | Volunteer for course under GIAN Scheme of Ministry of Human Resources and Development (MHRD) titled <i>Linear and Nonlinear Systems, and Opt. with Appl. in Medical Imaging, Optimal Design, and Graphics</i> (given by Prof. Eric de Sturler at IIT Indore). |
| 2013 | Volunteer for <i>Lecture Workshop of Three National Science Academies of India on Galois Theory, Finite Fields and Cryptography</i> organized by IIIT Allahabad.  |
| 2011 | Creating Documentation for <i>Seventh IEEE Conference on Wireless Communication and Sensor Networks (WCSN-2011)</i> organized by IIIT Allahabad in collaboration with WII Dehradun, NMDC Panna, and MP State Forest Department.                               |
| 2011 | Volunteer for <i>Fourth Science Conclave and INSPIRE Internship Program 2011: A Congregation of Nobel Laureates, Eminent Academicians and Scientists</i> organized by IIIT Allahabad.   |

### IIT Indore

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|-------------|-----------------------------------|
| 2015 – 2016 | Chief Election Officer.           |
| 2014 – 2015 | Member of the Election committee. |

### IIIT Allahabad

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| 2012 – 2013 | Head of the mess committee.   |
| 2011 – 2012 | Member of the mess committee. |

## Honors and Awards

### Academics

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|---------------------------|--|
| 2010, 2011,<br>2012, 2013 | GATE qualified (every time achieved a rank in top two percent of 200,000 test subjects). Graduate Aptitude Test in Engineering (GATE) is an examination for postgraduate admissions to various IITs. |
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## Sports

2012	Winner of the Intra-IIT Volleyball (Also, the Captain of PG's Volleyball team).
2009	Successfully Passed NCC-'C' Certificate examination under the authority of Ministry of Defence, India. NCC is an Indian military cadet corps.
2008	Successfully Passed NCC-'B' Certificate examination under the authority of Ministry of Defence, India.
2007	Successfully Attended the Combined Annual Training Camp conducted by No. 1(M.P.) Air Sqn NCC, Indore.
2005	Runner up in District level senior Volleyball competition.
2003	Runner up in State level junior Volleyball competition.

## References

- **Dr. Kapil Ahuja**  
Associate Professor in Comp. Sci. & Engg.  
Dean of International Affairs  
IIT Indore  
Khandwa Road, Simrol, Indore  
MP (453552), India  
Email: kahuja@iiti.ac.in
- **Dr. Akash Anand**  
Associate Professor in Mathematics and Statistics  
IIT Kanpur  
UP (208016), India  
Email: akasha@iitk.ac.in
- **Dr. Pavan Chakraborty**  
Associate Professor in Information Technology  
IIIT Allahabad  
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Email: pavan@iiita.ac.in