

# An Analysis of Research Productivity of Indian Institute of Technology's (IITs) with Special Reference to ResearchGate

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**Abstract** - This paper examines the memberships and research contributions of Indian Institute of Technology's (IITs) in ResearchGate. The data were extracted from ResearchGate website (<https://www.researchgate.net>) for this study during first week of September 2017. It was found that 18 IITs have contributed and also shared the research information through ResearchGate. Further the data was analyzed by Memberships of Faculties and Research Scholars, Research Contributions, ResearchGate (RG) Scores of IITs. It is found that the Indian Institute of Technology; Bombay has more members (8,439) with 6,320 publications and very less members by the Indian Institute of Technology; Palakkad has 15 members with no publications. It is suggested that Mandi, Gandhinagar, Jodhpur and palakkad IITs should come forward to contribute their research contributions in ResearchGate.

**Keywords:** Academic Social Networking Sites, ResearchGate, Social Networking Sites and Indian Institute of Technology and IIT's

## I. INTRODUCTION

Academic Social Networks are emerged based on the thirst of Research Scholars to share their research activities among their peers. The recent Academic Social Networks such as Academia.edu and Researchgate.net are allows researchers to communicate, share, collaborate, and follow or being followed and attracting millions of researchers providing better channels for scholarly communication. It is crystal clear that these research tools as a whole can energize their research and deliver them to the required usages. Many countries are using these research tools in their Institutes in order to improve the productivity of the research.

### A. ResearchGate

ResearchGate is the largest professional network for researchers; it enables researchers to connect with colleagues, build their scientific network and collaborate with one another using numerous applications that are unique to the scientific platform. It was founded in 2008 by physicians Dr. Ijad Madisch and Dr. Sören Hofmayer, and computer scientist Horst Fickenscher. ResearchGate today has more than 13+ million members. There are over 100+ million publications to go through and 1 million answers to research questions. ResearchGate is an effective tool for academic communication and most user-friendly. ResearchGate gives heavier focus on collaboration, discovery and interaction.

ResearchGate has number of features to help the research scholars and faculty members in Sharing publications, Connecting with colleagues, Seeking new collaborations, Obtaining statistics and metrics on use of uploaded publications, Asking questions of researchers around the world that have the same set of interests, Job seeking or recruitment, Creating profiles, Liking and following researchers and their publications, Endorsing the skills of others, Ability to bookmark favorites and Ability to comment or send feedback.

## II. REVIEW OF LITERATURE

Asnafi (2017) intended to survey on the participation of the Iranian Library and Information Science departments in ResearchGate as academic social networks. Iranian faculty members of the Library and Information Research and also analyzed the members, RG Score, Impact Points, Publications, Citations and Reads. Jeyapragash and Isaac Arputharaj (2017) discusses on objectives, importance and highlights of ResearchGate and its utilization in Tamilnadu State Universities in terms of publication, membership, total RG scores and top departments with members. Kuo, Tsai, Wu, and Alhalabi (2017) presented in empirical survey of the top 150 researchers' grants and their RG scores among 126 colleges of management in Taiwan and also found that a strong correlation between the research grants and RG scores based on the analysis of college as a whole. However, the relationship becomes insignificant for individual researchers.

Elsayed (2016) investigated Arab researchers' attitudes and perceptions toward the use of academicsocial networks (ASNs), with a sharp topical focus on the ResearchGate (RG) network. From sixArab universities, a sample of 2,991 Arab researchers was invited to participate by online questions and 315 participants filled out the questionnaire. The study revealed that three quarters of the respondents use ASNs to share publications and most researchers subscribed to more than one ASN, but RG was the most frequently used one. El-Berry (2015) attempted to explore the awareness and use of ResearchGate, Acedemia.edu, LinkedIn, Mendeley and Scholastica by the South Valley University (SVU)' academic staff. A structured questionnaire was sent by email and Facebook. Study revealed that most of the respondents were aware of and using the ASNSs. ResearchGate demonstrated the highest

level of awareness and usage followed by LinkedIn, Acedemi.edu, Mendeley and Scholastica, respectively. Marra (2015) addressed the Italian astrophysical research community. Online questionnaire was created in late September 2014 for the researchers working at the attitudes and behavior towards some major professional social networks such as ResearchGate, LinkedIn, and Academia and also their opinions about aspects of the main validation practices.

It found that professional social networks have been adopted widely (66%). ResearchGate results to be the most popular tool, followed by LinkedIn and social networks result to be used chiefly for enhancing research output dissemination and researchers' availability on the web. Mikki, Zygmuntowska, Gjesdal and Ruwehy (2015) compared profiles at five different profiling sites and they are ResearchGate, Academia.edu, Google Scholar Citations, Researcher ID and ORCID. It found that approximately 37% of researchers at the University of Bergen have at least one profile, the prevalence being more than (> 40%) for members at the Faculty of Psychology and the Faculty of Social Sciences. Across all disciplines, Research-Gate is the most widely used platform and also the Researchers are reluctant to maintain multiple profiles and there is little overlap between different services.

The study also investigated the correlation between bibliometric measures, such as publications and citations, and user activities, such as downloads and followers.

### III. OBJECTIVES OF THE STUDY

The following are the important objectives of this study.

1. To find out the memberships of IITs in ResearchGate.
2. To identify the research contributions of IITs in ResearchGate.
3. To analyze the ResearchGate (RG) Scores of IITs.
4. To examine the top ten departments with their members.
5. To find out the various types of documents by top ten departments with authors of IITs.

### IV. METHODOLOGY

The data were extracted from ResearchGate website (<https://www.researchgate.net>) during first week of September 2017. It was found that 18 Indian Institute of Technology (IITs) have contributed and also shared the information through ResearchGate. Further the data were analyzed to find out the memberships of IITs in ResearchGate their research contributions, ResearchGate (RG) Scores, top ten departments with their members and also to find out the various types of documents by top ten departments with authors of IITs. The collected data were analyzed using simple calculations with percentage and ranking were also used.

### V. DATA ANALYSIS

*A. Memberships of IITs in ResearchGate:* The study has analyzed the memberships by IITs in ResearchGate, and the same is given in Table I.

TABLE I MEMBERSHIPS BY IIT'S IN RESEARCHGATE

S. No.	Name of the Institutions	No. of Members	(%)	Rank
1	Indian Institute of Technology, Bombay	8439	15.60	1
2	Indian Institute of Technology, Madras	7813	14.44	2
3	Indian Institute of Technology, Delhi	6320	11.68	3
4	Indian Institute of Technology, Kharagpur	5659	10.46	4
5	Indian Institute of Technology, Kanpur	5288	9.77	5
6	Indian Institute of Technology, Guwahati	4757	8.79	6
7	Indian Institute of Technology, Roorkee	4737	8.76	7
8	Indian Institute of Technology, Varanasi	2711	5.01	8
9	Indian Institute of Technology, Hyderabad	1705	3.15	9
10	Indian Institute of Technology, (ISM) Dhanbad	1646	3.04	10
11	Indian Institute of Technology, Bhubaneswar	893	1.65	11
12	Indian Institute of Technology, Patna	890	1.64	12
13	Indian Institute of Technology, Indore	804	1.48	13
14	Indian Institute of Technology, Gandhinagar	787	1.45	14
15	Indian Institute of Technology, Ropar	606	1.12	15
16	Indian Institute of Technology, Jodhpur	505	0.93	16
17	Indian Institute of Technology, Mandi	500	0.92	17
18	Indian Institute of Technology, Palakkad	15	0.02	18
	Total	54075	100	

Table I shows that the membership of IITs in ResearchGate. It shows that the “Indian Institute of Technology; Bombay” has more members 8,439 (15.60%) and placed in first rank. It is followed by “Indian Institute of Technology; Madras” has 7,813 (14.44%) members and placed in second rank. It

is found that “Indian Institute of Technology; Delhi” has 6,320 (11.68%) members and placed in third rank. It is inferred that “Indian Institute of Technology; Palakkad” got the least members 15 (0.02%) in ResearchGate among the IIT’s.

TABLE II RESEARCH CONTRIBUTIONS BY IIT’S IN RESEARCHGATE

S. No.	Name of the Institutions	No.of Publications	(%)	Rank
1	Indian Institute of Technology, Delhi	9336	19.98	1
2	Indian Institute of Technology, Ropar	7284	15.58	2
3	Indian Institute of Technology, Kharagpur	6806	14.56	3
4	Indian Institute of Technology, Madras	6177	13.22	4
5	Indian Institute of Technology, Kanpur	5359	11.46	5
6	Indian Institute of Technology, Bombay	5179	11.08	6
7	Indian Institute of Technology, Roorkee	3443	7.36	7
8	Indian Institute of Technology, Guwahati	1847	3.95	8
9	Indian Institute of Technology, Dhanbad	644	1.37	9
10	Indian Institute of Technology, Hyderabad	204	0.43	10
11	Indian Institute of Technology, Varanasi	140	0.29	11
12	Indian Institute of Technology, Patna	90	0.19	12
13	Indian Institute of Technology, Indore	72	0.15	13
14	Indian Institute of Technology, Bhubaneswar	66	0.14	14
15	Indian Institute of Technology, Mandi	31	0.06	15
16	Indian Institute of Technology, Gandhinagar	30	0.06	15
17	Indian Institute of Technology, Jodhpur	16	0.03	17
18	Indian Institute of Technology, Palakkad	0	0.00	18
	Total	46724	100	

TABLE III RESEARCHGATE (RG) SCORES BY IIT’S

S. No.	Name of the Institutions	RG Score	(%)	Rank
1	Indian Institute of Technology, Bombay	22265.72	13.80	1
2	Indian Institute of Technology, Kharagpur	21809.97	13.52	2
3	Indian Institute of Technology, Delhi	20011.06	12.41	3
4	Indian Institute of Technology, Madras	19714.58	12.22	4
5	Indian Institute of Technology, Kanpur	15511.31	9.62	5
6	Indian Institute of Technology, Roorkee	14424.61	8.94	6
7	Indian Institute of Technology, Guwahati	14091.03	8.73	7
8	Indian Institute of Technology, Varanasi	6802.40	4.21	8
9	Indian Institute of Technology, Dhanbad	5602.87	3.47	9
10	Indian Institute of Technology, Hyderabad	4485.84	2.78	10
11	Indian Institute of Technology, Indore	3886.91	2.41	11
12	Indian Institute of Technology, Bhubaneswar	2475.79	1.53	12
13	Indian Institute of Technology, Patna	2453.29	1.52	13
14	Indian Institute of Technology, Ropar	2365.69	1.46	14
15	Indian Institute of Technology, Mandi	2341.09	1.45	15
16	Indian Institute of Technology, Gandhinagar	1658.86	1.02	16
17	Indian Institute of Technology, Jodhpur	1221.45	0.75	17
18	Indian Institute of Technology, Palakkad	110	0.06	18
	Total	161232.47	100	

*B. Research Contributions of IITs in ResearchGate*

The study has analyzed the research contributions by IIT's in ResearchGate and the same is given in Table II. Table II shows that the research contributions of IITs in ResearchGate. It indicates that the Indian Institute of Technology, Delhi has 9,336 (19.98%) publications in ResearchGate and placed in first rank followed by Indian Institute of Technology, Ropar has 7,284 (15.58%) publications and occupied second rank. It is inferred that last nine listed IITs has less than 1% of publications, whereas the first eight IITs has more than 3% of publications in ResearchGate.

*C. ResearchGate (RG) Scores of IIT's*

The study was analyzed the ResearchGate (RG) Scores of IITs in ResearchGate and the same is given in Table III. It is

found from Table III indicates that the ResearchGate (RG) Scores of IITs in ResearchGate. It is clearly shows that the "Indian Institute of Technology; Bombay" has 22,265.72 (13.80%) highest RG scores and placed in first rank. It is followed by "Indian Institute of Technology; Kharagpur" 21,809.97 (13.52%) and "Indian Institute of Technology; Delhi" has 20,011.06 (12.41%) RG scores and occupied second and third rank. It is inferred that "Gandhinagar", "Jodhpur" and "Palakkad" IITs has less than 1% of RG Scores, whereas listed first ten IIT's has good percentage of RG scores in ResearchGate.

*D. Top Ten Departments along with Members*

The study was analyzed the IIT's top ten departments along with the members in ResearchGate and the same is given in Table IV.

TABLE IV IIT'S WITH TOP TEN DEPARTMENTS ALONG WITH MEMBERS

S. No.	Name of the Departments	Members	(%)	Rank
1	Mechanical Engineering, IIT, Madras	1233	17.04	1
2	Electrical Engineering, IIT, Bombay	1033	14.27	2
3	Engineering, IIT, Delhi	792	10.94	3
4	Electrical Engineering, IIT, Kanpur	745	10.29	4
5	Mechanical Engineering, IIT, Guwahati	672	9.28	5
6	Civil Engineering, IIT, Roorkee	456	6.30	6
7	Mechanical Engineering, IIT, Kharagpur	417	5.76	7
8	Electrical Engineering, IIT, Hyderabad	372	5.14	8
9	Mechanical Engineering, IIT, Varanasi	327	4.51	9
10	Mechanical Engineering and Mining Machinery Engineering, IIT, Dhanbad	220	3.04	10
	Total	7325	100	

Table IV indicates that the top ten departments along with members of IITs in ResearchGate. It explains that the "Mechanical Engineering" of "Indian Institute of Technology; Madras" is toping with 1233 (17.04%) members and placed in first rank. It is followed by "Electrical Engineering" of "Indian Institute of Technology;

Bombay" with 1033 (14.27%) members and occupied second rank. It further found that the "Mechanical Engineering and Mining Machinery Engineering" of "Indian Institute of Technology; Dhanbad" has less number of (220) members and placed in tenth rank in ResearchGate.

TABLE V TOP TEN DEPARTMENTS ALONG WITH PUBLICATIONS AND AUTHORS

S. No.	Name of the Departments	Publications	(%)	Authors	Rank
1	Electrical Engineering, IIT, Ropar	1052	21.27	1222	1
2	Electrical Engineering, IIT, Delhi	947	19.15	822	2
3	Electrical Engineering, IIT, Bombay	758	15.33	918	3
4	Mechanical Engineering, IIT, Madras	664	13.43	755	4
5	Electrical Engineering, IIT, Kanpur	602	12.17	703	5
6	Mechanical Engineering, IIT, Kharagpur	470	9.50	509	6
7	Mechanical Engineering, IIT, Guwahati	221	4.47	282	7
8	Civil Engineering, IIT, Roorkee	171	3.46	294	8
9	Electrical Sciences, Bhubaneswar	23	0.47	26	9
10	Mechanical Engineering and Mining Machinery Engineering, IIT, Dhanbad	11	0.22	19	10
		4945	100		

### *E. Top Ten Departments along with Publications and Author*

The study was analyzed the IITs wise top ten departments along with publications and authors in ResearchGate and the same is given in Table V. Table V shows that the IITs with top ten departments along with publications and authors of the same in ResearchGate. It indicates that the top department “Electrical Engineering” of “Indian Institute of Technology; Ropar” has 1052 (21.27%) publications from 1222 authors and placed in first rank, which is followed by “Electrical Engineering” of “Indian Institute of Technology; Delhi” has 947 (19.15%) publications from 822 authors and “Electrical Engineering” of “Indian Institute of Technology; Bombay” has 758 (15.33%) publications from 918 authors and occupied second and third rank.

It is found that the “Mechanical Engineering and Mining Machinery Engineering” of “Indian Institute of Technology; Dhanbad” has less number of (11) publications from 19 authors and placed in tenth rank in ResearchGate respectively.

## **VI. CONCLUSION AND RECOMMENDATIONS**

ResearchGate is the Social Networking platform to share, communicate and contribute the research activities. ResearchGate gained very good momentum in academic institutions to increase the institutional visibility and

research collaborations. Indian Institutions are started using the platform for sharing their research activities. The study recommends that that IIT’s of Ropar, Jodhpur, Mandi and Palakkad has to increase their research activities in ResearchGate to get more visibility and collaborations.

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