

CURRICULUM VITAE

VIVEK LAHA

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Current Position

At present working as an Assistant Professor in the Department of Mathematics, Institute of Science, Banaras Hindu University, Varanasi, India since June 02, 2016.

Research Interests

Multiobjective Optimization; Variational Inequalities; Generalized Convexity; Nonsmooth Analysis; Semi-infinite Programming; Robust Optimization; Interval-Valued Programming; Mathematical Programs with Vanishing/Equilibrium/Switching Constraints

Education

Degree	University	Year	Discipline
Ph.D.	Banaras Hindu University, India Thesis Link: http://hdl.handle.net/10603/275660	2014	Mathematics
M.Sc.	Banaras Hindu University, India	2009	Mathematics
B.Sc.	V.B.S. Purvanchal University, India	2006	Mathematics

Postdoctoral Employments

Date	Position	University/Institute
June 02, 2016 to present	Assistant Professor	Banaras Hindu University, Varanasi, India
January 01, 2016-June 01, 2016	Assistant Professor	Indian Institute of Technology Patna, India
January 30, 2015-December 31, 2015	NBHM Postdoctoral Fellow	Banaras Hindu University, India

Publications

Edited Book

1. **Laha, V.**, Marechal, P., and Mishra, S.K. (Eds.) (2021). Optimization, Variational Analysis and Applications, Springer Proceedings in Mathematics and Statistics, Vol. 355, Springer Singapore. <https://link.springer.com/book/10.1007/978-981-16-1819-2>

Chapters in Proceedings/Edited Books

2. **Laha, V.**, Singh, V., Pandey, Y., and Mishra, S.K. (2022). Nonsmooth Mathematical Programs with Vanishing Constraints in Banach Spaces. In: Nikeghbali, A., Pardalos, P.M., Raigorodskii, A.M., Rassias, M.T. (eds) High-Dimensional Optimization and Probability. Springer Optimization and Its Applications, vol 191. Springer, Cham. https://doi.org/10.1007/978-3-031-00832-0_13
3. Jaisawal, P., Singh, H.N., and **Laha, V.** (2021). On nonsmooth minimax semiinfinite programming problems with mixed constraints, Proceedings of the International Conference on Nonlinear Analysis and Convex Analysis & International Conference on Optimization: Techniques and Applications-I-(Hakodate, Japan, 2019), pp. 127-148. <http://www.ybook.co.jp/book/NACA-ICOTA2019/naca-icota-I-contents>
4. **Laha, V.**, Kumar, R., and Pandey, L. (2021). On nonsmooth multiobjective semidefinite programs and vector variational inequalities using convexificators, Proceedings of the International Conference on Nonlinear Analysis and Convex Analysis & International Conference on Optimization: Techniques and Applications-I-(Hakodate, Japan, 2019), pp. 351-370. <http://www.ybook.co.jp/book/NACA-ICOTA2019/naca-icota-I-contents>
5. **Laha, V.**, Kumar, R., Singh, H.N., and Mishra S.K. (2021) On Minimax Programming with Vanishing Constraints. In: **Laha, V.**, Maréchal, P., Mishra, S.K. (eds.) Optimization, Variational Analysis and Applications. IFSOVAA 2020. Springer Proceedings in Mathematics & Statistics, Vol. 355. Springer, Singapore. https://doi.org/10.1007/978-981-16-1819-2_11
6. Jaisawal, P., **Laha, V.**, and Mishra, S.K. (2020). On sufficiency and duality for non-smooth semi-infinite problems with mixed constraints in terms of Michel-Penot subdifferentials, in: Treanta, S. (Eds.), Recent Advances in Nonlinear Analysis and

Optimization with Applications, pp. 119-138, Cambridge Scholars Publishing, UK.
<https://www.cambridgescholars.com/product/978-1-5275-5954-7>

7. **Laha, V.** and Singh, H.N. (2020). On Multi-objective Optimization Problems and Vector Variational-Like Inequalities. In: Deo N., Gupta V., Acu A., Agrawal P. (eds) Mathematical Analysis II: Optimisation, Differential Equations and Graph Theory. ICRAPAM 2018. Springer Proceedings in Mathematics & Statistics, Vol. 307. Springer, Singapore. https://doi.org/10.1007/978-981-15-1157-8_3
8. Mishra, S.K., Singh, V., **Laha, V.**, and Mohapatra, R.N. (2015) On constraint qualifications for multiobjective optimization problems with vanishing constraints. In: H. Xu et al. (eds.), *Optimization Methods, Theory and Applications*, **Springer-Verlag Berlin Heidelberg**, https://doi.org/10.1007/978-3-662-47044-2_6

SCI/SCIE Indexed Publications

9. Singh, H.N. and **Laha, V.** (2022). On Minty variational principle for quasidifferentiable vector optimization problems. *Optimization Methods and Software*, 1-19. <https://doi.org/10.1080/10556788.2022.2119235>
10. **Laha, V.** and Jaisawal, P. (2022). "On sufficiency and duality for multiobjective programming problems using convexificators" *Filomat*, 36 (9), 3119–3139. <https://doi.org/10.2298/FIL2209119J>
11. Singh, H.N. and **Laha, V.** (2022). On Quasidifferentiable Multiobjective Fractional Programming. *Iran J Sci Technol Trans Sci* 46, 917–925. <https://doi.org/10.1007/s40995-022-01309-2>
12. **Laha, V.** and Mishra, S.K. (2017). On vector optimization problems and vector variational inequalities using convexificators. *Optimization* 66 (11) 1837-1850. <http://dx.doi.org/10.1080/02331934.2016.1250268>
13. Al-Shamary, B., Mishra, S.K., and **Laha, V.** (2016). On approximate starshapedness in multiobjective optimization. *Optimization Methods and Software* 31 (2), 290-304. <https://doi.org/10.1080/10556788.2015.1064917>
14. Mishra, S.K. and **Laha, V.** (2016). On minty variational principle for nonsmooth vector optimization problems with approximate convexity. *Optimization Letters* 10 (3), 577-589. <https://doi.org/10.1007/s11590-015-0883-6>

15. Mishra, S.K., Singh, V., and **Laha, V. (2016)**. On duality for mathematical programs with vanishing constraints. *Annals of Operations Research* 243 (1-2), 249-272. <https://doi.org/10.1007/s10479-015-1814-8>
16. **Laha, V.**, Mishra, S.K., and Singh, V. (2015). On characterizing the blunt minimizers of epsilon convex programs. *Journal of Nonlinear and Convex Analysis* 16 (2), 321-329. <http://www.yokohamapublishers.jp/online2/opjnca/vol16/p321.html>
17. **Laha, V.**, Al-Shamary, B., and Mishra, S.K. (2014). On nonsmooth V-invexity and vector variational-like inequalities in terms of the Michel-Penot subdifferentials. *Optimization Letters* 8, 1675–1690. <https://doi.org/10.1007/s11590-013-0707-5>
18. Mishra, S.K. and **Laha, V. (2013)**. A Note on the Paper “On Approximately Star-Shaped Functions and Approximate Vector Variational Inequalities”. *Journal of Optimization Theory and Applications* 159, 554–557. <https://doi.org/10.1007/s10957-013-0341-5>
19. Mishra, S.K. and **Laha, V. (2013)**. On Approximately Star-Shaped Functions and Approximate Vector Variational Inequalities. *Journal of Optimization Theory and Applications* 156, 278–293. <https://doi.org/10.1007/s10957-012-0124-4>
20. Mishra, S.K. and **Laha, V. (2012)**. On V-r-invexity and vector variational-like inequalities. *Filomat* 26 (5), 1065–1073. <http://www.jstor.org/stable/24895810>

Scopus Indexed Publications

21. Mishra, S.K., Kumar, R., **Laha, V.**, and Maurya, J.K. (2022). Optimality and duality for semidefinite multiobjective programming problems using convexificators, *J. Appl. Numer. Optim.* 4, 103-118. <https://doi.org/10.23952/jano.4.2022.1.08>
22. **Laha, V.**, Kumar, R., and Maurya, J. (2022). Saddle point criteria for semidefinite semi-infinite convex multiobjective optimization problems. *Yugoslav Journal of Operations Research*. <https://doi.org/10.2298/YJOR201223001L>
23. Jaisawal, P., Antczak, T., and **Laha, V. (2021)**. On sufficiency and duality for semi-infinite multiobjective optimization problems involving V-invexity. *International Journal of Mathematics in Operational Research*, 18(4), 465-483. <https://doi.org/10.1504/IJMOR.2021.114204>
24. Gupta, P.; Mishra, S.K., and **Laha, V. (2019)**. On approximate variational principle for vector optimization problems with local sharp efficiency. *Adv. Nonlinear Var. Inequal.*, Vol. 22, No. 1, 79-89.

25. **Laha, V.** and Singh, H.N. (2019). On multiobjective optimization problems involving $V-r$ -invexity. *Comm. Appl. Nonlinear Anal.* 26(1), 76-85.
26. **Laha, V.** and Pandey, L. (2018). On strongly convex functions of higher order for multiobjective optimization problems in terms of the Clarke's subdifferentials. *PanAmer. Math. J.* 28(4), 68-78.
27. Mohapatra, R.N., Shukla, K., and **Laha, V.** (2018). On vector variational inequalities and E -pseudoconvex multiobjective programming problems. *PanAmerican Mathematical Journal* 28 (3), 94-103.
28. **Laha, V.**, Mishra, S.K., and Verma, R.U. (2017). On Strict Vector Variational Inequalities. *Advances in Nonlinear Variational Inequalities* 20 (1), 11-25.
29. Mishra, S.K. and **Laha, V.** (2013). On Generalized Minty and Stampacchia Vector Variational-Like Inequalities and V-Invex Vector Optimization in Asplund Spaces. *Advances in Nonlinear Variational Inequalities* 16(2), 43-60.
30. Mishra, S.K., **Laha, V.**, and Verma, R.U. (2011). Generalized Vector Variational-Like Inequalities and Nonsmooth Vector Optimization of Radially (eta, alpha)-Continuous Functions. *Advances in Nonlinear Variational Inequalities* 14(2), 1-18.

Other Publications

1. Jaisawal, P. and **Laha, V.** (2021). "On optimality and duality for nonsmooth robust multiobjective semiinfinite programming problems with mixed constraints", *Linear and Nonlinear Analysis* 7(3), 365-386.
2. Jaisawal, P., **Laha, V.**, and Mishra, S.K. (2019). On semi-infinite optimization problems under the generalized convexity. *Indian Journal of Industrial and Applied Mathematics* 10 (1), 87-108.
3. Mishra, S.K., **Laha, V.**, and Al-Shamary, B. (2012). Relationships between optimization of V-invex function and vector variational-like inequalities. *Indian Journal of Industrial and Applied Mathematics* 3 (1), 104-113.

Visits Abroad

- Presented a paper titled “On solving nonsmooth optimization problems using variational inequalities involving convexifiers” and chaired a session in the joint conference of the International Conference on Nonlinear Analysis and Convex Analysis and the International Conference on Optimization: Techniques and Applications (NACA-ICOTA2019) at *Future University Hakodate, Hakodate, Japan* during August 26-31, 2019.
- Presented the paper titled “On Nonsmooth Vector Optimization under Epsilon Convexity” in the “9th International Conference on Optimization: Techniques and Applications (ICOTA 9)” during December 12-16, 2013 at *National Taiwan University of Science and Technology (Taiwan Tech), Taipei, Taiwan*.
- Presented the paper titled “Approximately Starshaped Functions and Approximate Vector Variational Inequalities” in the “Spring School-Workshop on Analysis and Approximation in Optimization under Uncertainty” during February 18-23, 2013 organized by the *Vietnam Institute for Advanced Study in Mathematics (VIASM), Hanoi, Vietnam*.

Presentations in National/International Conferences/Workshops/

Duration	Title of talk	Event	Venue
December 19-22, 2022	On quasidifferentiable optimization problems	2nd International Conference on Nonlinear Applied Analysis and Optimization (ICNAAO-2022)	IIT (BHU), Varanasi (Hybrid Mode)
September 15-17, 2022	On approximate quasi efficient solutions for quasidifferentiable multiobjective optimization problems	5th National Conference on Multidisciplinary Design, Analysis and Optimization	Indian Institute of Technology, Bombay
September 13-16, 2022	On quasidifferentiable mathematical programs with	XIII International Symposium on Generalized Convexity and	Lima, Peru (Online Mode)

	equilibrium constraint	Monotonicity	
January 29-30, 2022	On optimization problems with data uncertainty	37th Annual National Conference of the Mathematical Society Banaras Hindu University on Modern Mathematics and its Applications (MMA2022)	Department of Mathematics, Institute of Science, Banaras Hindu University, Varanasi, India.
December 21-23, 2021	On mathematical programs with equilibrium constraints under data uncertainty	International Conference on Nonlinear Applied Analysis and Optimization 2021	Department of Mathematical Sciences, IIT (BHU), Varanasi, India
February 02-04, 2020	On Mathematical Programs with Vanishing Constraints	The Indo-French Seminar on Optimization, Variational Analysis and Applications (IFSOVAA2020)	Department of Mathematics, Institute of Science, Banaras Hindu University, Varanasi, India
November 25-December 06, 2013	On approximate convex programs	CIMPA-UNESCO-IN DIA Research School 2013	Department of Mathematics, University of Delhi, India
January 22-25, 2013	On epsilon convexity and Minty variational principle for differentiable vector optimization problems	78th Annual Conference of Indian Mathematical Society	Department of Mathematics & DST-CIMS, Banaras Hindu University, Varanasi-221 005, India
January 09-11, 2013	On characterizing the blunt minimizers of epsilon convex programs	International Symposium on Applied Optimization and Game –Theoretic Models	Indian Statistical Institute, Delhi Centre, Delhi, India
November 29-December 01, 2012	On Vector Optimization and Vector Variational Inequalities	International Conference on Optimization Modeling and Applications	Department of Operational Research, University of Delhi, Delhi, India

January 05-07, 2012	On Directionally Approximately Starshaped Functions and Directionally Approximately Vector Variational Inequalities	International Conference on Game Theory, Operations Research and their Applications	Indian Statistical Institute, Chennai Center, Chennai-600 113, India
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Session Chair

- Chaired a session in the "National conference of Academy for Progress of Mathematics on Recent Advances in Mathematical Analysis and Applications (NCAPM-RAMAA-2022)" at ***DST-Center for Interdisciplinary Mathematical Sciences, Institute of Science, Banaras Hindu University Varanasi-221005, India*** during May 07-08, 2022.
- Chaired a paper presentation session in the “International Conference on Nonlinear Applied Analysis and Optimization 2021” at the ***Department of Mathematical Sciences, IIT (BHU), Varanasi, India*** during Dec 21-23, 2021.
- Chaired a session in the joint conference of the International Conference on Nonlinear Analysis and Convex Analysis and the International Conference on Optimization: Techniques and Applications (NACA-ICOTA2019) at ***Future University Hakodate, Hakodate, Japan*** during August 26-31, 2019.

Participation in National/International Conferences/Seminars/Workshops

1. Participated in the “**Training Programme on Optimizations and Its Applications**” during **November 29-December 01, 2012** organized by the ***Department of Operational Research, University of Delhi, Delhi, India.***
2. Participated in the “**Workshop on Game Theory**” during **January, 03-04, 2012** at the ***Indian Statistical Institute, Chennai Centre, Chennai-600 113.***
3. Participated in the “**Advanced Training Programme on Optimization and Its Applications**” during **November 23-29, 2011** at the ***Department of Science and Technology, Centre for Interdisciplinary Mathematical Sciences, Banaras Hindu University, Varanasi-221 005, India.***

4. Participated in the “**Training Programme on Nonlinear Analysis and Applications to Optimization and Game Theory**” during **November 16-19, 2011** at the *Department of Mathematics, Aligarh Muslim University, Aligarh, India.*
5. Participated in the “**National Instructional Workshop On Graph Theory and Its Applications**” during **May 23-28, 2011** at the *Department of Science and Technology, Centre for Interdisciplinary Mathematical Sciences, Banaras Hindu University, Varanasi-221 005, India.*
6. Participated in the “**Satellite Conference on International Congress of Mathematicians (ICM-2010) on Mathematics in Science and Technology**” during **August 14-17, 2010** at the *Indian Habitat Centre, Lodhi Road, New Delhi, India.*
7. Participated in the “**Summer School on Analytic Questions in Arithmetic**” during **July 23-August 07, 2010** at **Tata Institute of Fundamental Research, Colaba, Mumbai-400 005, India.**
8. Participated in the “**International Conference on Optimization and Its Applications (ICOIA-2010)**” during **February 16-18, 2010** at the *Department of Mathematics, Faculty of Science, Banaras Hindu University, Varanasi-221 005, India.*
9. Participated in the “**Training Program on LATEX and Other Open Source Software**” during **December 07-12, 2009** at the *Department of Science and Technology, Centre for Interdisciplinary Mathematical Sciences, Banaras Hindu University, Varanasi-221 005, India.*

Fellowships

- **January 30, 2015 – December 31, 2015:** Awarded **NBHM Postdoctoral Fellowship** of *Department of Atomic Energy, Government of India* (Ref. No. 2/40(47)/2014/R&D-II/1170 dated January 29, 2015).
- **January 01, 2013 to July 31, 2014:** Awarded **CSIR-UGC (NET) SENIOR RESEARCH FELLOWSHIP** (R./Dev./Sch./ (UGC-JRF-243)/S-01/27683 dated February 16, 2013).
- **January 01, 2011 to December 31, 2012:** Awarded **CSIR-UGC (NET) JUNIOR RESEARCH FELLOWSHIP** (R./Dev./Sch./ (UGC-JRF-243)/S-01/29945 dated March 23, 2011).

- **October 10, 2009 to December 31, 2010:** Awarded **UGC Research Fellowship** for the **Ph.D.** by **Banaras Hindu University** (No. R/Dev/IX-Sch. (BHU Res. Sch.)2009-2010/24582 dated March 12, 2010).

Fundings

- Received a grant of **Rs. 1,07,952** under **ITS Scheme of Science & Engineering Research Board (SERB)** to attend and present my research work in the joint conference of the “*International Conference on Nonlinear Analysis and Convex Analysis and the International Conference on Optimization: Techniques and Applications (NACA-ICOTA2019)*” at *Future University Hakodate, Hakodate, Japan* during **August 26-31, 2019**. (Ref. No. SERB/F/2945/2020-2021 dated August 31, 2020)
- Received **CSIR Foreign Travel Grant** of **Rs. 49,889** to attend and present my paper in the “**9th International Conference on Optimization: Techniques and Applications (ICOTA 9)**” during **December 12-16, 2013** at *National Taiwan University of Science and Technology (Taiwan Tech), Taipei, Taiwan*. (Ref. No. TG/8338/13-HRD dated Oct 28, 2013)
- Received **DST-PURSE Foreign Travel Grant** of **Rs. 33,000** to attend and present my paper titled “**Approximately Starshaped Functions and Approximate Vector Variational Inequalities**” in the “**Spring School-Workshop on Analysis and Approximation in Optimization under Uncertainty**” during **February 18-23, 2013** at *Vietnam Institute for Advanced Study in Mathematics (VIASM), Hanoi, Vietnam*.

Academic Qualifications

- Qualified the **Joint CSIR-UGC Test for Junior Research Fellowship and Eligibility for Lectureship (NET)** held on **June 20, 2010** for the award of **JUNIOR RESEARCH FELLOWSHIP** and secured **0272/0379 rank** in the subject **MATHEMATICAL SCIENCES** under **UGC Fellowship scheme** (Ref. No: 20-06/2010(i) EU-IV dated December 20, 2010).
- Qualified the **Joint CSIR-UGC Test for the Junior Research Fellowship and Eligibility for Lectureship (NET)** held on **December 20, 2009** and secured **rank 0126/0237** in the subject **MATHEMATICAL SCIENCES** under **ELIGIBILITY FOR LECTURESHIP (NET)** category (Ref. No: 20-12/2009(ii) EU-IV).

- Qualified **Combined Research Entrance Test (CRET-2009)** in **Mathematics** for the admission in **Ph.D.** conducted by *Banaras Hindu University, Varanasi, India.*

Projects

S.N.	Title of the Project	Funding	Amount	Tenure
1.	Some applications of approximate convexity in recent optimization problems	UGC-FRPS Start-Up Grant	Rs. 10,00,000/- (Ten Lakhs Only)	2017-2020

Administrative Responsibilities

- Member of the Annual Report Preparation Committee, Department of Mathematics, Institute of Science, Banaras Hindu University (2020-present)
- Member of the Open Book Examination Committee, Department of Mathematics, Institute of Science, Banaras Hindu University (2020-present)
- Member of the Institute Day Celebration Committee held on December 16, 2021
- Member of the Undergraduate Admission Coordination Committee (UACC), Institute of Science, Banaras Hindu University (2020-2021)
- Member of the Laboratory Committee, Department of Mathematics, Institute of Science, Banaras Hindu University (2020-2021)
- Member of the Organizing Committee of 101th Convocation Of Banaras Hindu University held on December 23, 2019

Teaching

B.Sc. Courses: MTB101: Calculus I; MTB102: Geometry; MTB201: Calculus II, MTB302: Differential Equations; MTB401: Partial Differential Equations; MTB402: Mathematical Methods; MTB506: Operations Research; MTB508: Business Mathematics

M.Sc. Courses: MTM204: Theory of Optimization

Ph.D. Course Work: MTPC107: Theory of Nonlinear Optimization

Professional Activities

Reviewer

Mathematical Reviews by *American Mathematical Society.*

Referee of International Journals

Fuzzy Optimization & Decision Making published by *Springer New York.*

Filomat published by *University of Nis, Serbia*.

Optimization published by **Taylor & Francis**.

Memberships

Member of the “**Working Group on Generalized Convexity**”

Member of the “**International Society on Multiple Criteria Decision Making**”

Ph.D. Scholars Supervised

S.N.	Name of the scholar	Title of Thesis/Topic of Research	Year of Award/Submission
1.	Dr. Rahul Kumar	On Optimality and Duality Theory for Optimization Problems	2021 (Awarded)
2.	Dr. Pushkar Jaisawal	Some Contributions to Recent Problems in Optimization	2021 (Awarded)
3.	Dr. Harsh Narayan Singh	Some recent contributions to multiobjective optimization problems under quasidifferentiability	2022 (Awarded)
4.	Ms. Prachi Sachan	Some applications of convexifiers in optimization theory	Ongoing (March 2020. Term)
5.	Ms. Akriti Dwivedi	Some contributions to interval-valued programming problems	Ongoing (March 2021 Term)
6.	Ms. Priyanka Bharati	Some contributions to semidefinite programming	Ongoing (March 2022 Term)
7.	Mr. Prashant Jaiswal	On optimization problems involving quasidifferentiability	Ongoing (July 2022 Term)

Useful Links

Google Scholar: <https://scholar.google.co.in/citations?user=K83s9QOAAAAJ&hl=en>

ORCID Profile: <https://orcid.org/0000-0002-0584-9500>

Scopus Author ID: <https://www.scopus.com/authid/detail.uri?authorId=48361603700>

Department: <https://www.bhu.ac.in/science/mathematic/vivek.php>

ResearchGate: <https://www.researchgate.net/profile/Vivek-Laha>

CV of Vivek Laha