# Billy Graham Ram

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## Objective

Looking for job opportunities to contribute to the field of Precision Agriculture and machine learning. My research interests include remote sensing, proximal sensing (hyperspectral, multispectral and RGB), GIS, robotics in agriculture, embedded systems and IoT.

## Education

**North Dakota State University, ND, USA** 2020 - present
PhD. Candidate. CGPA: 3.704/4

**Sam Higginbottom University of Agriculture, Technology and Sciences, UP, India** 2018 - 2020
Master of Technology in Irrigation and Drainage. CGPA: 7.6/10.00

**Sam Higginbottom University of Agriculture, Technology and Sciences, UP, India** 2013 - 2017
Bachelor of Technology in Agricultural Engineering. CGPA: 8.46/10.00

## Work Experience

**Graduate Research Assistant (GRA) at NDSU** September 2020 - present
Working as a GRA under the supervision of Dr. Xin Sun at the Department of Agricultural and Biosystems Engineering at NDSU. Works include research in Hyperspectral Imaging, embedded systems and UAV's. Additionally, maintaining and managing 84 TB of group's research database.

**Teaching Assistant (TA) at NDSU** August 2022 - present
Working as a TA at the Department of Agricultural and Biosystems Engineering at NDSU. Teaching labs for PAG 215: Mapping of Precision Ag Data and PAG 315: Electronic Systems in Precision Ag

**Teaching Assistant at SHUATS** August 2019 - August 2020
Worked as a Teaching Assistant in the Department of Irrigation and Drainage Engineering at SHUATS, under the supervision of Dr. ir. D.M.Denis. Work included conducting lab classes for M.Tech students, maintaining official department documents, inventory maintenance and board meeting minutes.

## Technical Skills

- Python, MATLAB, ArcGIS Pro, QGIS, Autodesk's Fusion 360, WebODM, 3D Printing, LaTeX
- Operating Systems: LINUX, Windows and Mac OS

## Training And Internships

- One-month vocational training in the manufacturing unit factory, HMT Limited, Pinjore, Chandigarh June 2016
- AutoCAD 2D and 3D, Bangalore, India. June 2015

## Achievements

- Inducted as a Barry scholar after participating in Map the Systems, Problems to Possibility competition in NDSU. Won a individual scholarship of $1000. March 2023
- Won Second prize of $550 in the American Society of Agricultural and Biological Engineer's Student Robotics Design Competition. The goal was to create a robot that could autonomously navigate and harvest cotton bolls from a simulated cotton plant. July 2022
- Won a first prize of $2000 in the American Society of Agricultural and Biological Engineer's Fresh Face Video Competition. In which I conceptualized, filmed, and edited the final video submission. January 2021
- Made a video titled, "Eye in the sky that saves money" to introduce school students to the field of Remote Sensing. This video was made with STEM @ NDSU.
- Achieved an All India Rank of 140 with 92 percentile in GATE Exam, Graduate Aptitute Test in Engineering is a national level engineering entrance examination 2019 - 2022
- TOEFL-iBT score of 106/120 (Reading-26, Listening-27,Speaking-26,Writing-27) 2019 - 2021

## Other Interests

- Writing, Photography and documentary film-making.

## Conferences

- Attended ASABE's AIM in Omaha, Nebraska. Presented an abstract titled, "Deep Learning-based Weed Identification using Hyperspectral Imaging" — 9th–12th July 2023
- Attended ASABE's AIM in Houston, Texas. Presented an Abstract and participated in a Robotics competition and won second prize. — 17th–20th July 2022
- Attended the National Workshop on Techniques in Hyperspectral Data Analysis and Processing — IESD, Banaras Hindu University, Varanasi — 27th–31st January 2020
- Attended the International Workshop on Sustainable Agricultural Mechanization: Prospects and Challenges for Indian Agriculture — SHUATS & AIT, SHUATS — 29th March 2017
- Attended the Intellectual Property Rights (IPR) workshop — SHUATS —16th November 2016
- Attended the National Conference on Science, Engineering and Information Technology for River Ecosystems Conservation, Restoration and Management organized by River Water User Association (India) on 25th-26th April 2015

## Publications

- **Ram, B. G.**, Oduor, P., Igathinathane, C., Howatt, K., Sun, X. (2023). A Systematic Review of Hyperspectral Imaging in Precision Agriculture: Analysis of its Current State and Future Prospects **(In submission, September 2023)**
- **Ram, B. G.**, Zhang, Y., Costa, C., Ahmed, M. R., Peters, T., Jhala, A., Howatt, K., Sun, X. (2023). Palmer amaranth Identification using Hyperspectral Imaging and Machine Learning Technologies in Soybean Field. **(In submission, March 2023)**
- Malik, A., **Ram, B. G.**, Arumugam, D., Jin, Z., & Sun, X. (2023). Predicting gypsum tofu quality from soybean seeds using hyperspectral imaging and machine learning. **(In submission, May 2023)**
- Rai, N., Zhang, Y., **Ram, B. G.**, Schumacher, L., Yellavajjala, R. K., Bajwa, S., & Sun, X. (2023). Applications of deep learning in precision weed management: A review. Computers and Electronics in Agriculture, 206, 107698.
- Costa, C., Zhang, Y., Howatt, K., **Ram, B.**, Stenger, J., Nowatzki, J., . . . Sun, X. (2022). Palmer Amaranth (Amaranthus palmeri S. Watson) and Soybean (Glycine max L.) Classification in Greenhouse Using Hyperspectral Imaging and Chemometrics Methods. Journal of ASABE, 65(1), 179-188. doi:https://doi.org/10.13031/ja.14321
- Ahmed, M. R., **Ram, B. G.**, Koparan, C., Howatt, K., Zhang, Y., & Sun, X. Multiclass Classification on Soybean and Weed Species Using a Novel Customized Greenhouse Robotic and Hyperspectral Combination System. Available at SSRN 4044574.

## Presentations

- Field application of hyperspectral imaging for weed identification Presented by: Billy Ram North Dakota State University, Fargo North Dakota; **Ram, B.**, Mohammed Raju Ahmed, Yu Zhang, Xin Sun (Submission ID: 2100787, July 2021, ASABE AIM)
- Field hyperspectral image classification of Palmar amaranth and soybean using supervised machine learning Presented by: Billy Ram North Dakota State University, Fargo North Dakota; **Ram B.**, Mohammed Raju Ahmed, Yu Zhang, Xin Sun (Submission ID: 2200721, July 2022, ASABE AIM)
- Deep learning based weed identification using hyperspectral imaging. Presented by: Billy Ram North Dakota State University, Fargo North Dakota; **Ram B.**, Xin Sun (Submission ID: 2301457, July 2023, ASABE AIM)