

The Terascale All-Sensing Research Studio (TARS, <https://tars-home.github.io>) at Wright State University, led by Dr. Natasha Banerjee and Dr. Sean Banerjee, and located in Dayton, Ohio, United States, is inviting applicants for multiple PhD positions with start date in Spring 2026 and/or Fall 2026. Students will conduct research in using artificial intelligence (AI), extended reality (XR), and robotics to perform "recyclofacturing", or manufacturing of products to user-specifications from scrap metal. U.S. citizens, U.S. permanent residents, and international students with the listed qualifications are invited to apply.

TARS has a history of publications at high-ranked venues, such as CVPR, ICRA, ECCV, NeurIPS, RO-MAN, and IEEE VR. Alumni who have done their research through TARS have acquired industry positions at several well-established companies such as Google, Kitware, Delsys, Zebra Technologies, LMI, Lockheed Martin, and Northrup Grumman among others. Our recyclofacturing project is supported by our recently acquired Future Manufacturing Research Grant (FMRG) through the U.S. National Science Foundation (NSF).

Positions for PhD are available in the following 3 areas, one position per area:

- a. AI-enabled Computer-Aided Design (CAD)
- b. XR guidance in product weld and assembly
- c. Human-robot interaction (HRI) for assistance in weld and assembly

The project fully covers tuition and stipend for the PhD through the grant.

Expected Qualifications:

1. Master of Science or equivalent degree in Computer Science, Computer Engineering, or closely allied fields. A Bachelor of Science will also be considered if sufficient evidence is shown for the expected skills listed below.
2. Strong foundation in mathematical concepts such as multivariable calculus, linear algebra
3. Well-versed knowledge of programming languages such as Python, C++, CUDA, including knowledge of mathematical operations on tensors and GPU and main memory allocation and management as done in packages such as NumPy, CuPy, PyTorch, TensorFlow
4. In-depth working knowledge of at least one of the following techniques: attention models and Transformer architectures, generative models such as diffusion models and score-matching, and deep reinforcement learning methods such as policy gradients and actor-critic models
5. Prior demonstrable experience shown through thesis, project work or publications in at least one of the following areas, corresponding to the respectively advertised positions (topics are provided as examples, evidence for experience in other topics in the respective area will be considered as well):
 - a. CAD: Topics such as mesh processing using programmatic approaches, 3D model representations used in neural processing such as SDF, B-Rep, CAD assembly sequences
 - b. XR: Topics such as application development in augmented reality / virtual reality, studies, data collection, and data analysis
 - c. Robotics/HRI: Topics such as grasping, manipulation, robot learning, studies

Interested applicants are requested to email the PI, Dr. Natasha Banerjee at recyclofacturing@gmail.com with the following documents:

- A short cover letter summarizing the applicant's interest and qualifications (can be in the response email body)
- Resume/CV showing evidence for the above expected skillset and contact information (name, position, affiliation, email address) for 3 referees
- Undergraduate transcript
- Graduate transcript if applicable

Higher preference will be given to applicants who can demonstrate evidence through theses or publications at well-ranked venues in the considered fields.

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