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| **Project Title** | |
| Field Research Interest | Electrochemical measurement, biosensing |
| Abstract of the project[[1]](#footnote-1) | Fraunhofer USA, Inc. Center Midwest is located on the campus of Michigan State University in East Lansing, Michigan, USA. We are currently seeking highly motivated, reliable and technically competent individuals to join our electrochemistry team. Team members will conduct research both fabricating and utilizing carbon-based materials for electrochemical measurement. Team members will also assist in instrumentation development through circuit design and software programming. As a team member, you will help design and conduct experiments, generate data and present data in a meaningful report. We bridge the gap between academic research and industrial research. At times, you will also work with companies on current chemical measurement needs, and execute experiments based on a customer needs. Current projects include: Microelectrode implants for real-time measurement of dopamine in the brain, heavy metal microfluidic sensors for agriculture runoff water, custom fabricated boron doped diamond-based electrodes, and low cost electrochemical instrumentation using an Arduino potentiostat. |
| Tasks | Electrochemical measurement including: cyclic voltammetry, differential pulse voltammetry, electrical impedance spectroscopy  CAD design and 3D printing of custom lab equipment  Fabrication of custom electrodes  Data analysis utilizing: Origin Pro, Matlab/Python, MS Excel, MS PowerPoint  As needed custom programming for software/instrument control |
| Learning Outcomes[[2]](#footnote-2) | Applied research in a fast, academic/industrial lab setting. To be proficient in custom electrochemical sensor packaging, electrochemical measurement, and data processing. |
| Requirements | Background in chemistry, electrochemistry, microfabrication |
| Language Skills | English |
| Software Skills | MS Office, optional: Origin, Matlab, python |
| Other skills |  |
| Duration of the project (\*up to six months/6-12 months) | 9-12 months |
| Type of research project | Applied research |
| Responsible Professor | Prof. Dr. Wen Li, Michigan State University |
| Supervisor/Mentor | Dr. James Siegenthaler, Fraunhofer USA, Adjunct Prof. Michigan State University |
| Supervisor`s Telephone Number | Email first, and Zoom/Teams call is available |
| Supervisor`s Email | jsiegenthaler@fraunhofer.org |
| Faculty, Institute or Company Name | Fraunhofer USA, Center Midwest, Diamond and Coatings Technology Division |
| Address | 1449 Engineering Research Court, B100, East Lansing, MI 48824, USA |
| Can your project be completed virtually if global travel is not allowed or restricted in 2024? | No, on site |

1. Wherever possible, please avoid job-related terms such as “work” (=> project, research) and “internship” (=> research opportunity, research stay). [↑](#footnote-ref-1)
2. Please consider learning outcomes and/or choose applicable skills from the list below and mention how they will be acquired by the student:

   - professional skills e.g. *by using tool X / learning skills Y / using software Z*

   - intercultural competences and social skills *by collaborating with an international team*

   - (virtual) collaboration skills *by interacting with a team of X people via platform Y*

   - (virtual) communication skills *by…*

   - problem solving skills *by…*

   - the purposeful use of networked online tools *by…*

   - active, self-regulated learning skills *by…*

   - autonomous learning skills *by…*

   - etc... [↑](#footnote-ref-2)