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**RPPR Final Report**  
as of 29-Nov-2022

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**Report Date:** 30-Aug-2022

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**Final Report** for Period Beginning 31-May-2021 and Ending 30-May-2022

**Title:** Powder-based Additive Manufacturing Laboratory (PAM Lab)

**Begin Performance Period:** 31-May-2021

**End Performance Period:** 30-May-2022

**Report Term:** 0-Other

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**Distribution Statement:** 1-Approved for public release; distribution is unlimited.

**STEM Degrees:** 0

**STEM Participants:**

**Major Goals:** In this proposal, we have proposed to acquire the Innovent+ 3D printer system.

**Accomplishments:** Our proposal was funded in March 2021 during the Covid-19 pandemic time, by the Department of Defense Research and Education Program for Historically Black Colleges and Universities and Minority-Serving Institutions (HBCU/MI) Equipment/Instrumentation, under Funding Opportunity Announcement W911NF-20-S-0010. Due to the limitations imposed by Covid-19, the purchasing of the Innovent+ system took until the year after March 2022. Since March 2022 the COE management and the university facility have been trying to find a location to install the system there, and until this point, they have not been successful. The original location

## RPPR Final Report as of 29-Nov-2022

where the COE intended to place the system and was proposed in our initial submission did not get the final approval from the fire marshals and the university safety officers. The search across campus is still ongoing so hopefully, a suitable location can be found to install this system.

Due to this unpredictable situation, the PI and Co-PIs of this project cannot operate the Innovent+ system until it is fully installed. As soon as the system is installed, we will be following the rest of the activities that were proposed in our submission (i.e., Preliminary Data Collection and Optimization, In Integration with Existing Resources and Experiments, and Dissemination of the Data, and Publications).

**Training Opportunities:** Nothing to Report

**Results Dissemination:** Nothing to Report

**Honors and Awards:** Nothing to Report

**Protocol Activity Status:**

**Technology Transfer:** Nothing to Report

### **PARTICIPANTS:**

**Participant Type:** PD/PI

**Participant:** Sara Moghtadernejad

**Person Months Worked:** 1.00

Project Contribution:

National Academy Member: N

**Funding Support:**

### **Partners**

I certify that the information in the report is complete and accurate:

Signature: Sara Moghatdernejad

Signature Date: 11/28/22 9:00PM

**Final Report**  
**Powder-based Additive Manufacturing Laboratory (PAM Lab)**

PI: Dr. Sara Moghtadernejad

In this proposal we have proposed to acquire the Innovent+ 3D printer system. The schematic of this system is demonstrated in Figure 1.



Figure 1 Innovent+ system from ExOne, the most advanced and flexible binder jet 3D printer in a compact package

As mentioned in our proposal this printer is a multipurpose additive manufacturing tool with increased dust control and is the most advanced powder dispensing on the market. In details it poses a new re-coating technology that allows for the widest range of materials to be printed and produces the most consistent and uniform print bed that facilitates the production of reliable functional parts at PAM Lab in a variety of materials for automotive, biomedical, and aerospace research. Adding to that, with this system, CSULB benefits from a variety of big tech companies such as Intel, Tesla Motors, and SpaceX, by virtue of being in California, who rely on unique body parts for their manufacturing processes. We proposed to equip the PAM lab with the Innovent+ system to unlock the above potentials for the College of Engineering (COE) and College of Natural Science and Mathematics (CNSM) and their students. Notably, there are just two units of this device in the entire state of California with one in San Diego and another in San Francisco, and both are owned by the private sectors. This further emphasizes the unique opportunity

for CSULB faculty to promote this technology by educating and involving students in innovative and collaborative activities with nearby universities, governmental agencies, and private sectors. Finally, it should be noted that amongst the breakthrough innovations, none has the same potential as 3D printing to reverse the decline in productivity growth, and as such, now more than ever, the industry is in dire need of experts and related research.

Our proposal was funded in March 2021 during the Covid-19 pandemic time, by the Department of Defense Research and Education Program for Historically Black Colleges and Universities and Minority-Serving Institutions (HBCU/MI) Equipment/Instrumentation, under Funding Opportunity Announcement W911NF-20-S-0010. Due to the limitations imposed by Covid-19, the purchasing of the Innovent+ system took until the year after March 2022. Since March 2022 the COE management and the university facility have been trying to find the location to install the system there, and until this point they have not been successful. The original location that the COE intended to place the system and was proposed in our initial submission did not get the final approval from the fire marshals and the university safety officers. The search across campus is still on going so that hopefully a suitable location can be found to install this system.

Due to this unpredictable situation, the PI and Co-PIs of this project cannot operate the Innovent+ system until it is fully installed. As soon as the system is installed, we will be following the rest of the activities that was proposed in our submission (i.e., Preliminary Data Collection and Optimization, In Integration with Existing Resources and Experiments, and Dissemination of the Data, and Publications).

On behalf the co-PIs of this grant I would like to thank the Department of Defense for supporting our project.

Regards,

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