



## Correlating Geometry to Additive Manufacturing Process Signatures

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### Abstract:

Additive manufacturing systems are feed a set of instructions on how to complete a build, and these instructions have the potential to be correlated with signatures being given off by the additive manufacturing printing process. By correlating these instructions to signatures, it might be possible to derive the set of instructions that are associated with a specific geometry. Currently this idea is being implemented on a commercial thermoplastic 3D printer by embedding current, vibration, and temperature sensors; however, presently the primary focus is only on current and vibration signatures as preliminary temperature signatures have shown little correlation. Current and vibration signatures are being generated by printing simple geometries, and those signatures are collected by means of a national instruments sampling system. These signatures will then be analyzed for patterns that correspond to the geometries that produced them. This work will hopefully lead to remote monitoring systems that will inform and detail the exact geometries proliferators may be trying to additively manufacture.