

3-D PRINTING METALS MAP

— A **HOLISTIC** APPROACH —
TO ADDITIVE MANUFACTURING (3-D PRINTING)

MATERIALS

- microstructure control
- defect structure/porosity
- material recycling
- new alloy development

PART INSPECTION AND QUALIFICATION

- machine learning
and computer vision
- nondestructive evaluation
- mechanical testing

DESIGN

- geometric design
- topology optimization
- design optimization



PRINTING PROCESS

- powder spreading
- melt pool geometry
- process modeling
and process mapping
- laser powder bed, electron beam,
and binder jetting processes

INDUSTRY APPLICATIONS

- innovative component fabrication
- 3-D printing equipment training

COST

- manufacturing feasibility
- technology commercialization
modeling

Read more about how the NextManufacturing Center is defining the future
of additive manufacturing from metals to bio-printing at
www.engineering.cmu.edu/next

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