Oxford Performance Materials, Inc.

A Workshop on Predictive Theoretical and Computational Approaches for Additive Manufacturing

21st CENTURY
ENABLING TECHNOLOGIES

Predictive Theoretical and Computational Approaches for Additive Manufacturing

(9)Are there drivers to integrate computational simulation and advanced optimization methodologies to enable unique AM design?

Yes!

The promise of AM cannot be properly realized without the fusion of mature simulation systems and optimizers to foster migration from conventional design methodologies to a new paradigm.

As it stands, there currently exist few tools to enable design function to best utilize the freedoms of AM. These freedoms defeat the usual limiting assumptions of current design methods and software implementations thereof.

Current efforts from the CAD software industry reveal acquisitions to create unions of design and analysis suites - AUTODesk & WithinLabs and ANSYS & SPACECLAIM - to achieve depth in design capabilities.

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(10) What opportunities exist for public-private-partnerships to advance HPC capabilities for AM?

HPC will likely ~only~ be brought to practical fruition by a P-P entity. Why?

Issues – Same old, same old - lack of generally usable tools.
Code not compiled for HPC.
Software vendors not prepared (or willing) to migrate.

Possible pathway in software-as-service running on shared HPC platform (private cloud)? Or a distributed system (SETI)?

Many would-be HPC groups exist - little to no practical outcome for commonplace activity.

(11) How will those partnerships benefit from advancements?

Depends on structure of P-P entity...

Who owns the dataset? Who owns the algorithms? Who owns the code? Who owns the compute capacity?...

How does the P-P monetize the work product? Or will they?

Perhaps such P-P arrangements would be the home of shared services - relatively protected from market forces that drive current software biz models.

Perhaps simply licensers of developed tech.

(12) Do processing standards change with an analytical and mechanistic model approach to implementation of full scale additive manufacturing?

Do any actual processing standards now exist? In the general market, there seem only to be machine makers directives to run captive materials – systems that defeat the idea of applying common or objective rules.

The more open the AM machine system, the less likely there is to be ANY methodological process.

Any approach based on Science will be an improvement to the general user base.

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Questions
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Thanks