







Services

Training

- Custom & Project-based
- Onsite, CTC, Webcast
- Mobile Training Center



Onsite Consultation


- CAD/BIM Management
- Deployments
- Standards
- IT Advisement



Services




Software Implementation

- Template Creation
- Long-term planning
- Custom Services



Content Creation

- Revit Families
- Civil 3D Pipes, Subassemblies
- AutoCAD Blocks/Palettes




Services

Laser Scanning



Aerial Drones (UAV)



TOP VIEW AERIAL CAPTURE



Services

-  3D Printing
-  Virtual Modeling



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Free Technical Support

- Phone
- Email
- Salesforce Helpdesk
- Live Chat
- Remote Desktop Support
- File Transfer



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CTC Partners



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Midwest University

- March 21-22nd, 2018
- Two-day professional development conference focused on the AEC industry
- 500+ attendees from around the country
- Previous keynote speakers include: Amar Hanspal (formerly of Autodesk), Rick Khan (Mortenson) and Steve Blum (Autodesk)




3D Printing in Medical Simulation

- How it works
- Technologies available
- Use of application
- Wrap-up, Q&A




How it All (Kinda) Works

- 3D geometric model must meet material specifications
- Slices a 3D model into several 2D layers
–like printing every individual page of a book, all at once
- A guided piece of machinery traces those 2D layers
- Fuses model together layer by layer




3D Printing Technologies

- Fused Deposition Modeling (FDM)
- Stereolithography Apparatus (SLA)
- Selective Laser Sintering (SLS)
- Thermal Jet Printing (TJP)




Fused Deposition Modeling (FDM)

- Uses heated extruder to release thin line of plastic filament across 2D slice of model
- Extruder only moves in left/right motion, build plate moves up/down
- Most common material type is plastics, but the FDM technique can be used for much more




Stereolithography Apparatus (SLA)

- Prints in a liquified resin
- Uses flashes of light to harden a bed of material
- Light flashes along 2D image ("slice" of model), which hardens a single layer of liquid resin
- Primarily prints in plastic or hard resin




Selective Laser Sintering (SLS)

- Similar process as SLA, different material
- A roller spreads a compacted layer of powder across the build plate
- Uses higher-powered, focused light to penetrate and mold layers together (hence, "laser")
- Selective Laser Melting (SLM), exactly the same, metal materials instead of hard resins




Thermal Jet Printing (TJP)

- 3D printing technology that is most similar to 2D printing
- Uses one or more cartridges of material to bind layers together
- Can use up to 6 materials
- Cartridges are rolled straight across the layer, "injecting" material out at specific points



3D Printing in Medical Simulation

- Visualization/Studying
- Practice Dummies
- Surgical Training
- Equipment
- Prosthetics & Implants
- Biomedical Printing (human tissue)






Visualization/Studying

- Produce large amounts of parts to hand out to a classroom
- Immersive, hands-on learning
- Professional presentation, help win business



Practice Dummies

- Recreate specific conditions
- Multi-material printing necessary
– Cartilage on bone, muscle under skin, etc.
- 3D printing is arguably the best solution for creating these learning tools




Surgical Training





Surgical Training

- Rehearse difficult operations
- No waiting for replacements from donors



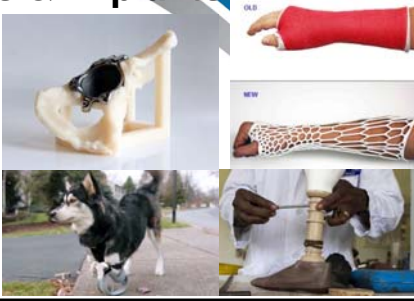
Equipment

- FDA approved
- 3D printed equipment can be sterilized and is biocompatible with current standards
- Allows for creating very specific or difficult to manufacture parts



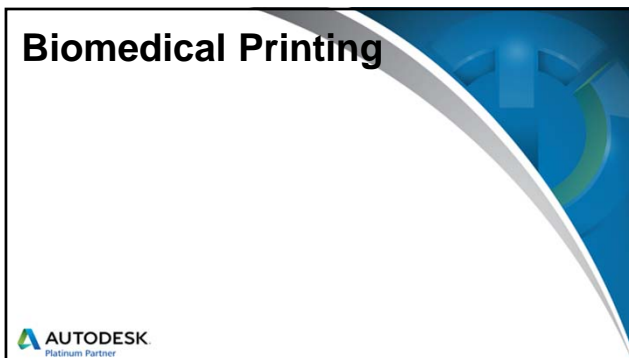
Prosthetics & Implants

- Custom forming
- Rapid-production
- Metalloid materials for implants
- Unique styles

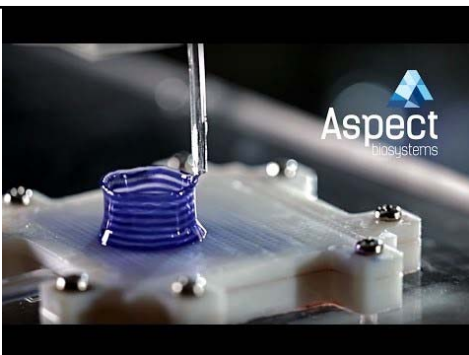


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Biomedical Printing



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Aspect
biosystems

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Biomedical Printing

- Using organic tissue as a material
- Not yet able to print functioning organs
- Replicate human conditions, observation
- Provides insight and potential solutions



Thank you!

