

EXECUTIVE SUMMARY

Revolutionizing Lightweighting through Patent-Protected, Ultra-Conforming, 'Intelligent' Metastructures

The Opportunity: Abemis has developed new mathematical tools, algorithms, and software for generating a unique class of ultra-lightweight, ultra-strong metastructures that can both dramatically lightweight components *and* provide unprecedented anti-vibration capabilities that no other existing technology can do. Our basic inspiration was the realization that a finite element type mesh *is an optimal metastructure in itself*, thereby replacing and exceeding (encompassing) the basic concept of a lattice. This is a major part of what we have US utility patented ([US10585420B2](#)) and form a strong IP basis for the unique metastructure generation technologies we are developing.

An important distinction is that Hgon hyperstructures can *be* lattices, but lattices can *never* be hyperstructures. Hgons *encompass* and are inevitably superior to all "lattice-type" software solutions. Our new Hgon generation code/methods also take advantage of Finite Element (FE) adaptive-mesh algorithms and latest AI optimization coding strategies.

We have an immediate customer base: Designers, Engineers, and Bioengineers that I have contacted across many industries are eager to design with our Hgon structures for aerospace, automotive, footwear, sports/military impact, robotics, bioengineered prosthetics, the list goes on... Essentially *millions* of companies and persons that use Additive Manufacturing (3D printing) or CNC methods can benefit from our technologies.

Our Solution in brief: Hgons are the first *mesh-based* metastructures that are utility patented, with significant advantages over lattice structures, the main being:

- True Conformance: Hgons *automatically* adapt to complex 3D shapes, lattices cannot
- Weight Reduction: Much stronger than lattices, 30%, 60% and more reductions
- Precision vibration control: Hgons enable 'tuning' of local density! (see right)
- AI-enabled for *adaptive* generation, optimization. Hgons are 'intelligent structures'

Our immediate financial goal: 5% or greater market penetration by second year. With proper tiered licensing, marketing, and adoption. We can expect to achieve \$40-50M revenue within 3-5 years. Currently we are far ahead in development – a Blender add-on is already working (as shown), and a stand-alone C++/python application for RTX-equipped PCs is in development, with alpha software version in progress.

Competition, our advantages: Our primary competitor (nTop.com) is currently valued at \$3.4B, but again *only relies on periodic lattice structures*. This is likely because we hold the critical US Utility Patent, thus we have a huge competitive advantage until 2038. Revenue advantage: Almost all manufacturing companies use CAD and FEA. Our patent forms a 'dam' or blocking moat, because there is no other way to compute tetrahedral or Hgon-like metastructures without violating our patent.

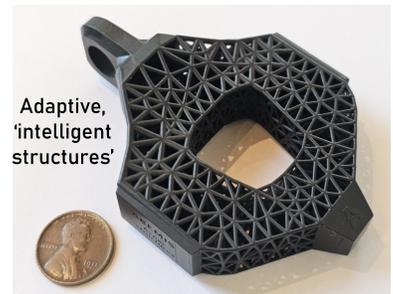
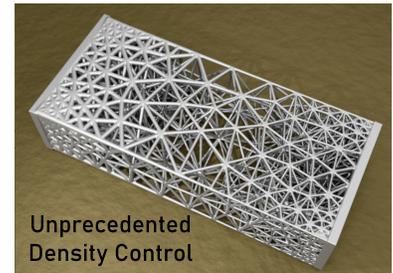
Market Strategy & Business Model: ABEMIS is transitioning from a proven R&D methodology to a high-margin Software-as-a-Service (SaaS) model. Our new method is proven (validated in *NATURE Scientific Reports*) and our immediate goal is to fine-tune and commercialize our software/IP-tools. We will will achieve early revenue from:

- Tiered Licensing (affordable is important): \$90-\$300/yr for student/personal/micro-entities; \$1,000/yr for SMEs; \$5,000/yr for Enterprise seats. This is a highly competitive price. Student plan: considering free for students, non-commercial use.
- Platform Integration: Native add-on for Blender3D, SolidWorks, Altair. Stand-alone PC-RTX software suite.
- Strategic Alliances: Active engagements with companies that want to license and/or incorporate our technologies.
- High Value: Custom ultra-high performance components, e.g. Aerospace, Auto, Sports, Military. Acquisition or buy-out.

ASK: We are seeking **\$4 million in Seed funding** to commercialize our existing Python/C++ codebases and establish significant market presence. **Primary Milestones:** 8-12 month development cycle with an 8 person team to launch commercial plugin (first version) and establish dedicated office and prototyping facility. 12-24 months software improvement and aggressive marketing campaign. By 36 months significant (>\$20M) Revenue from both software sales and licensing of our patented technologies.

Financial Potential: Projected to reach \$40-50M+ in annual revenue through licensing, sale, or exiting by Year 4-5 with EBITDA margins exceeding 60%. There is a high possibility of additional revenue, because our new method is likely to be needed and incorporated into *every* CAD software just like lattices have been, but better. I can now provide real-time demos upon request.

Ultimate Exit Strategy: There are two likely outcomes, (1) Mass licensing revenue and continuation of subscription revenue streams from our software tools and patents and/or, (2) Within 3-5 years, acquisition by a large Enterprise Engineering company (e.g. Altair, Solidworks, ANSYS, advanced manufacturing, or *any* large 3D print company) **for a considerable sum**, \$100M+ range.



Hgons: New ultra-light, 'intelligent' metastructures — superior to lattices.