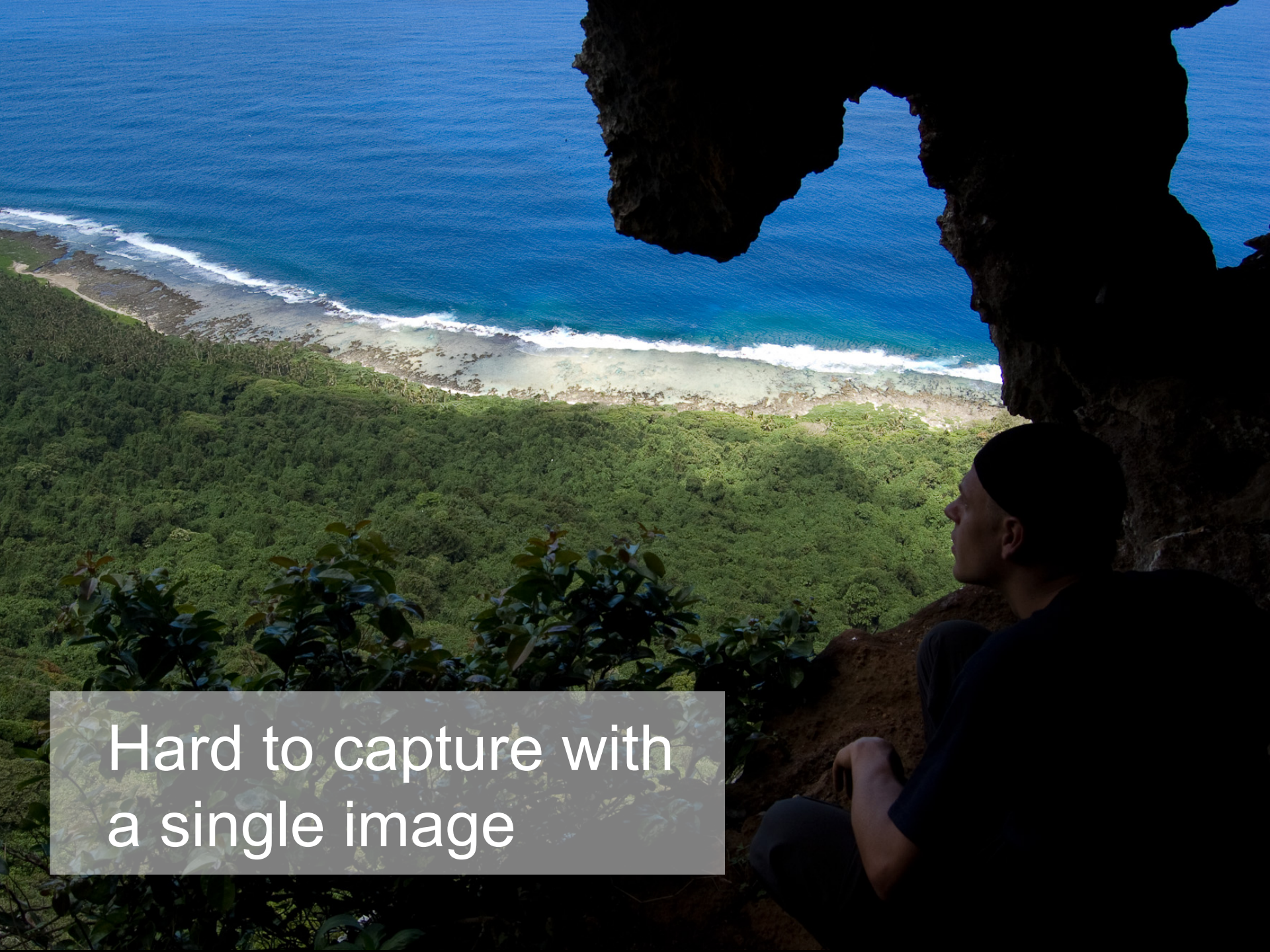

// Motivation


Tonga


Hard to capture with
a single image

Solution: Panoramas

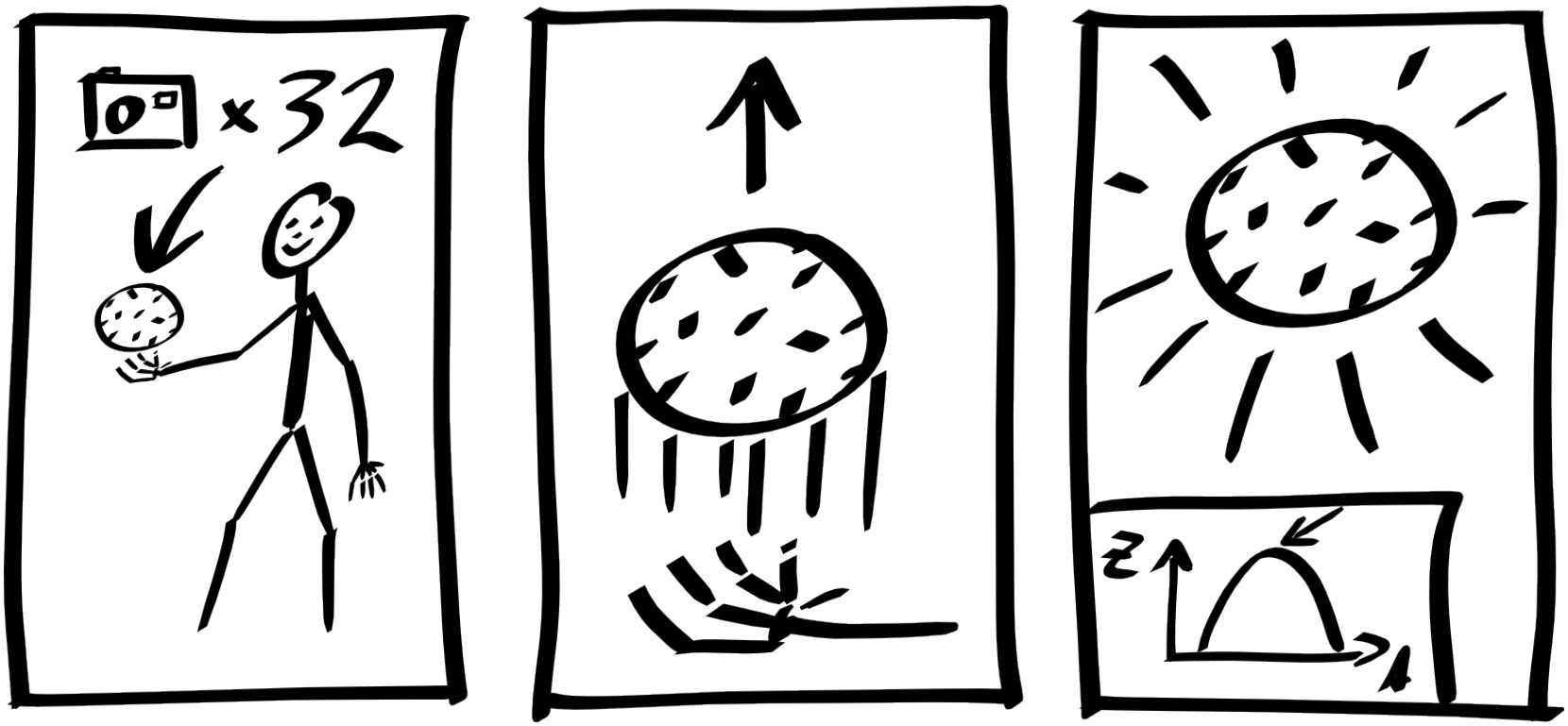




Downside: tedious and time consuming


// Idea

Idea





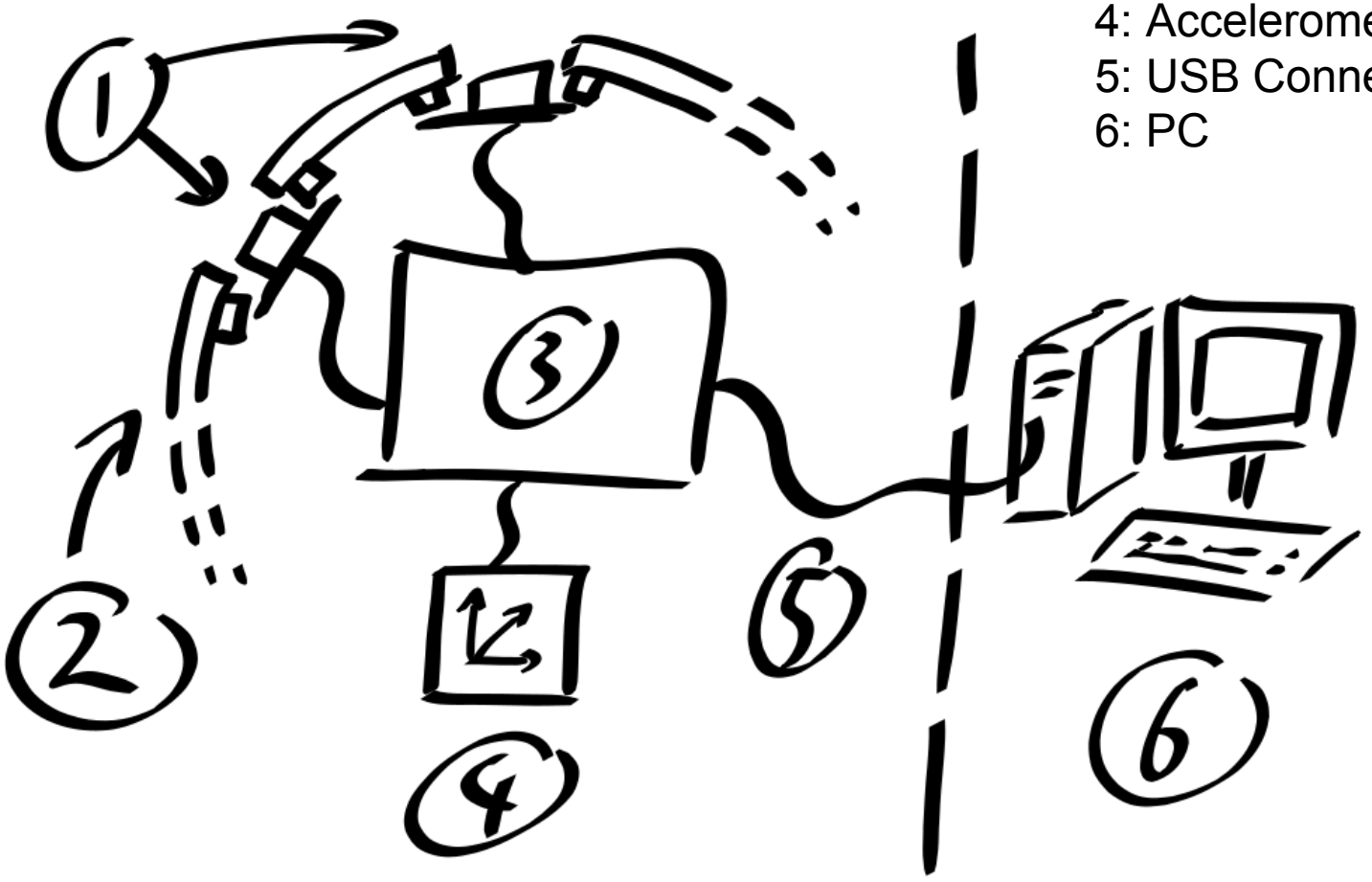
Throwable Panoramic Ball Camera

Jonas Pfeil, Kristian Hildebrand, Carsten Gremzow, Bernd Bickel, Marc Alexa

TU Berlin

System

1: Cameras
2: Enclosure
3: Microcontroller
4: Accelerometers
5: USB Connection
6: PC



Previous Work

- Camera tossing



Foto: sunface13 on Flickr (http://www.flickr.com/photos/sunface13/489988942/)



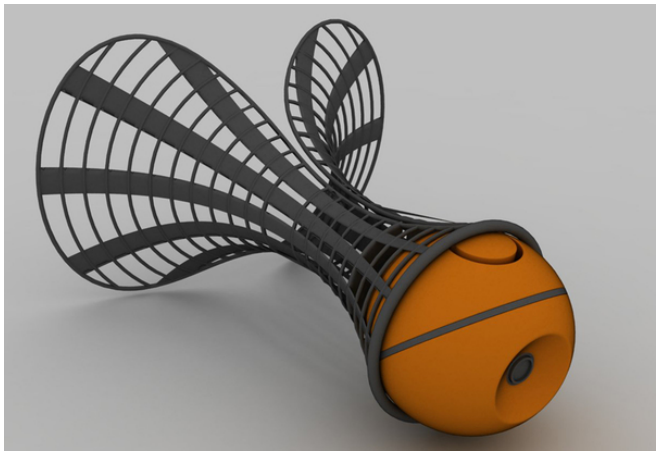
Foto: wcupmartin6 on Flickr (http://www.flickr.com/photos/wcupmartin6/2812310641/)

Previous Work

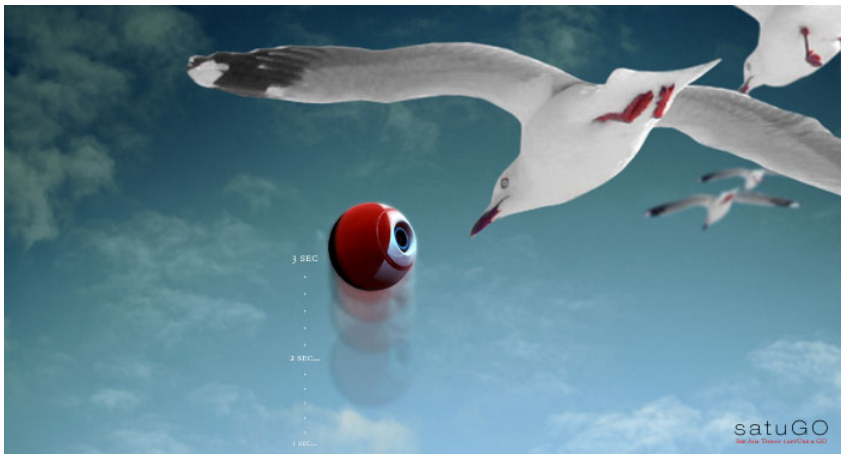
- Design concepts
  - triops
  - flee
  - SatuGO



Grafik: Franziska Faoro (http://www.franziskafaoro.de/)



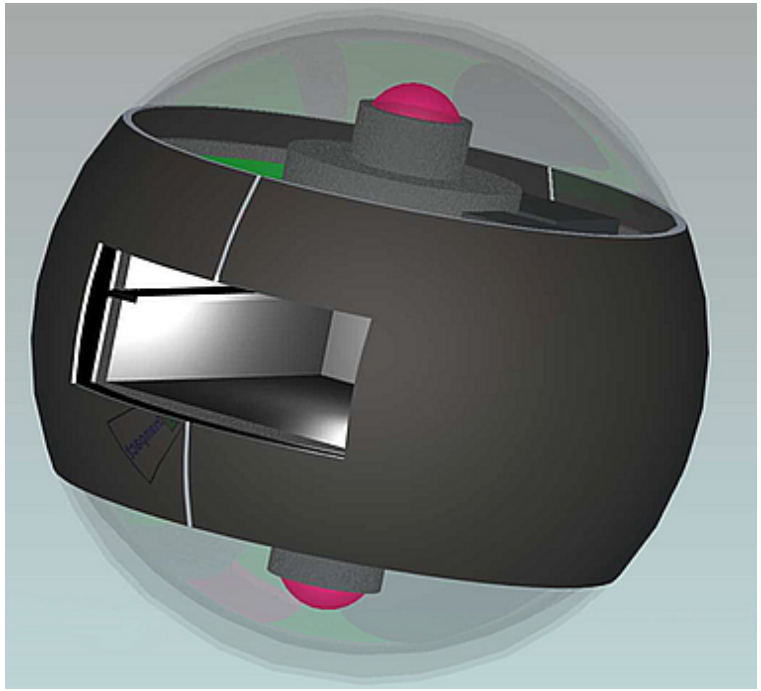
Grafik: hakan bogazpinar (http://www.behance.net/Gallery/flee-digital-cam/106492)



Grafik: Eschel Jacobsen and Mads Ny Larsen (http://www.satugo.com/)

iBall

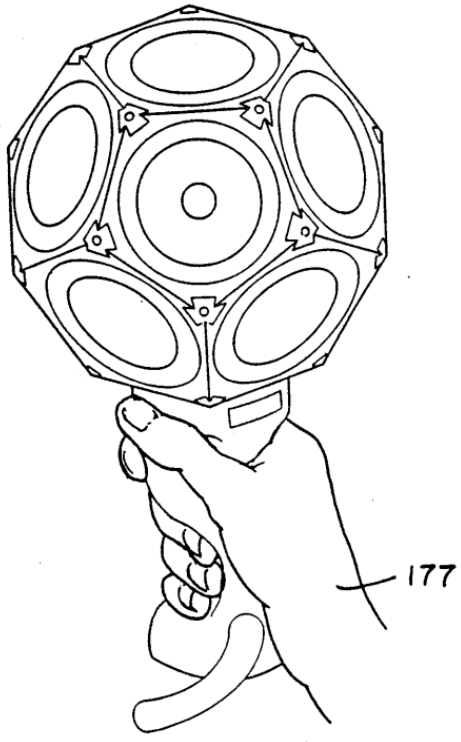
- In development?
  - I-Ball (Dreampact)



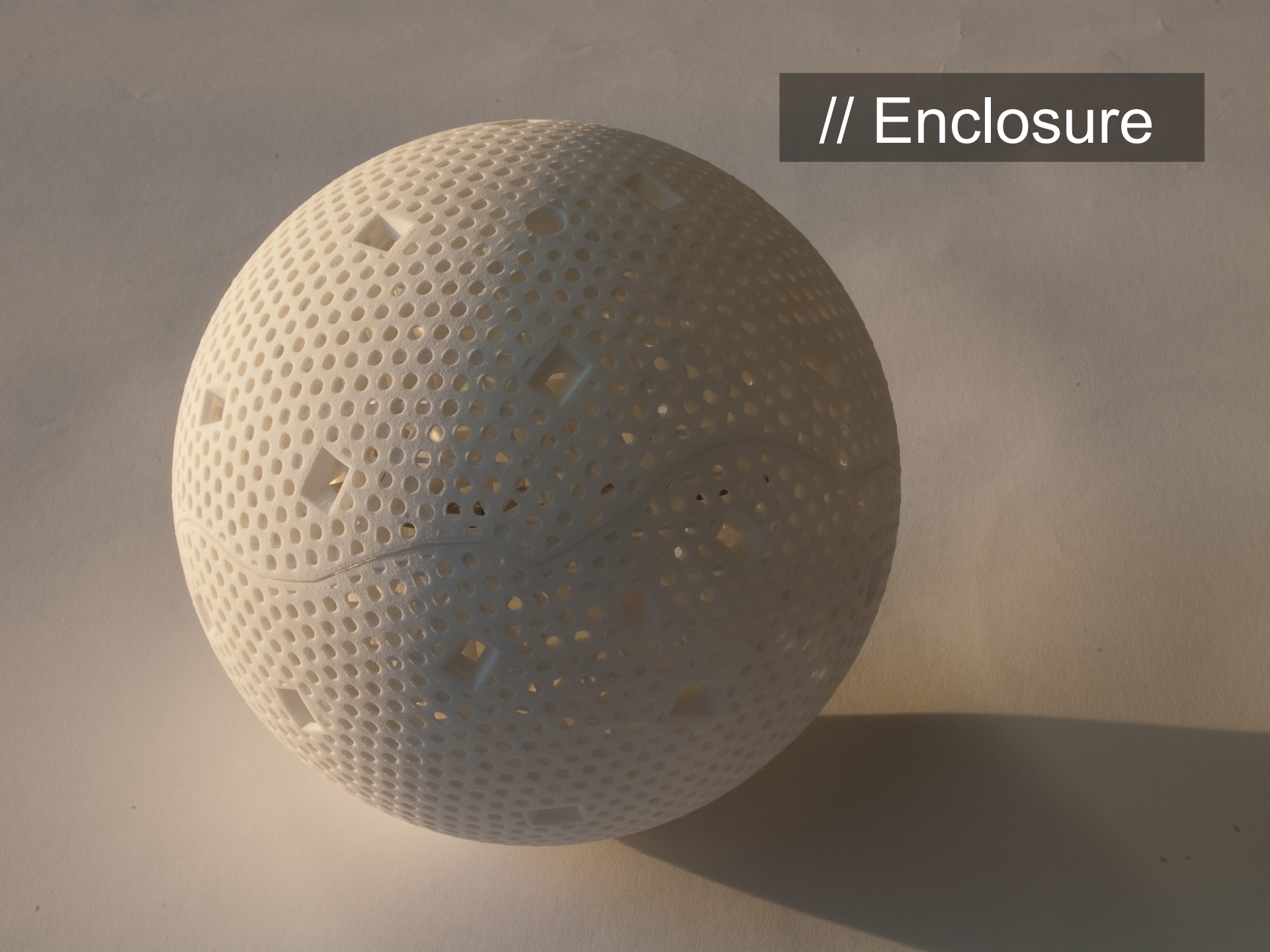
Grafik: Ministry Of Defence, MOD (http://www.golem.de/0811/63625.html)

Previous Work

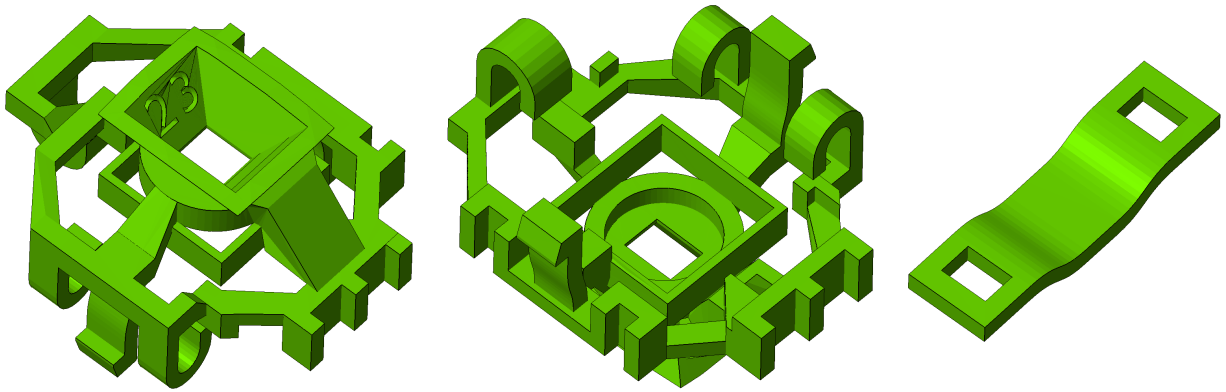
- Patents
  - Spherical panoramas
  - 3D

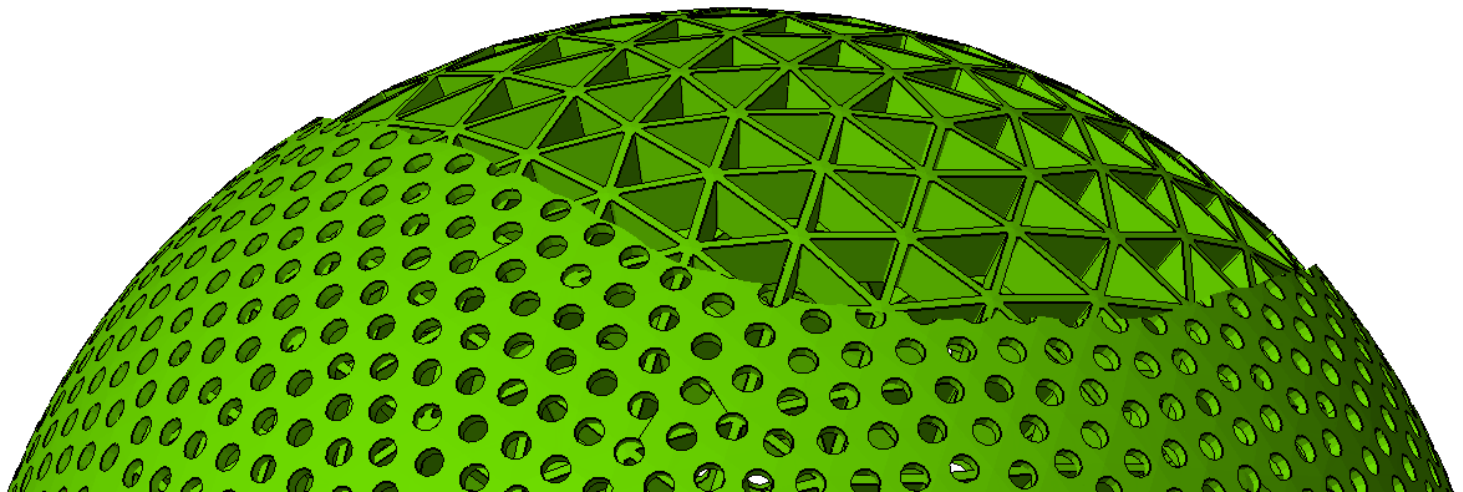


Grafik: McCutchen, D. “Method and apparatus for dodecahedral imaging system”, 1991

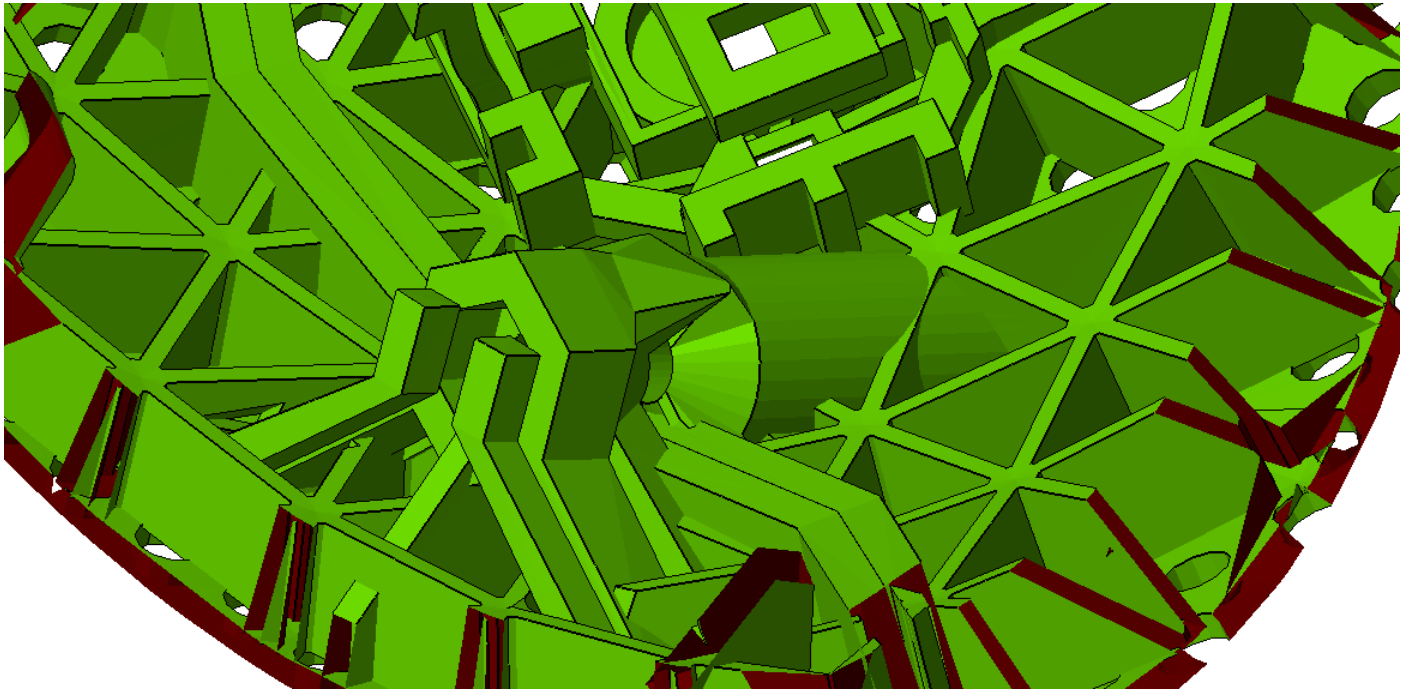

// Enclosure

Hull and Camera Mounts

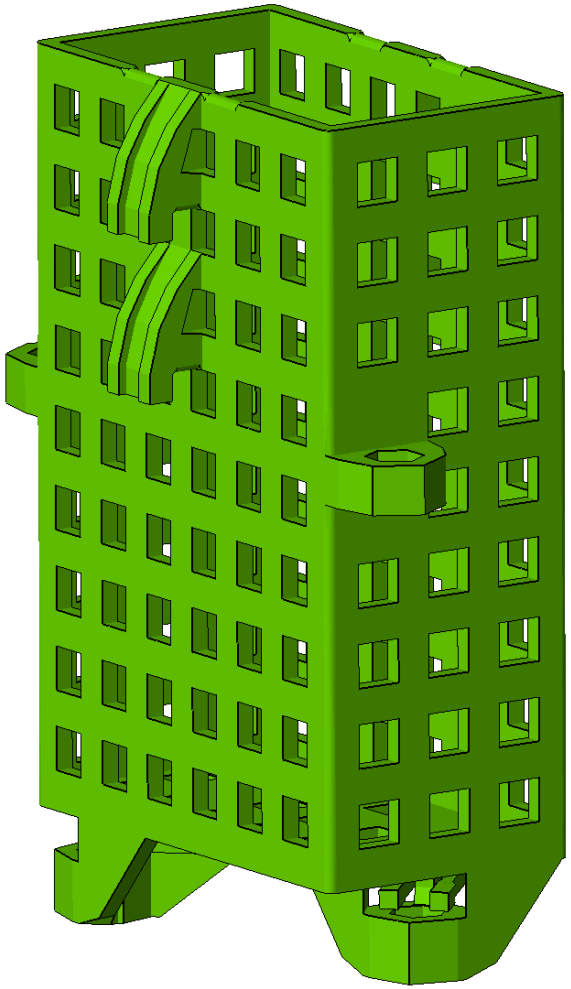


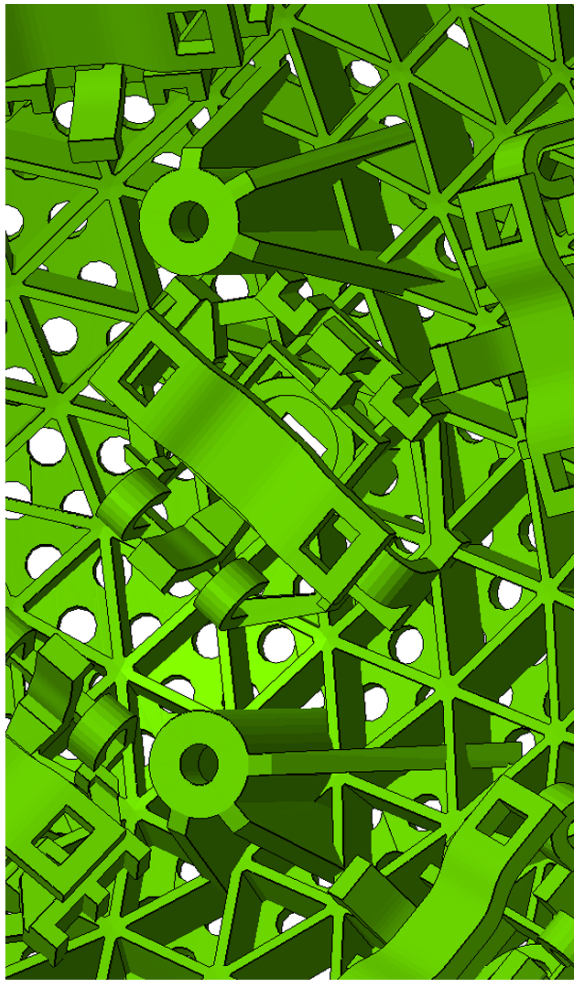


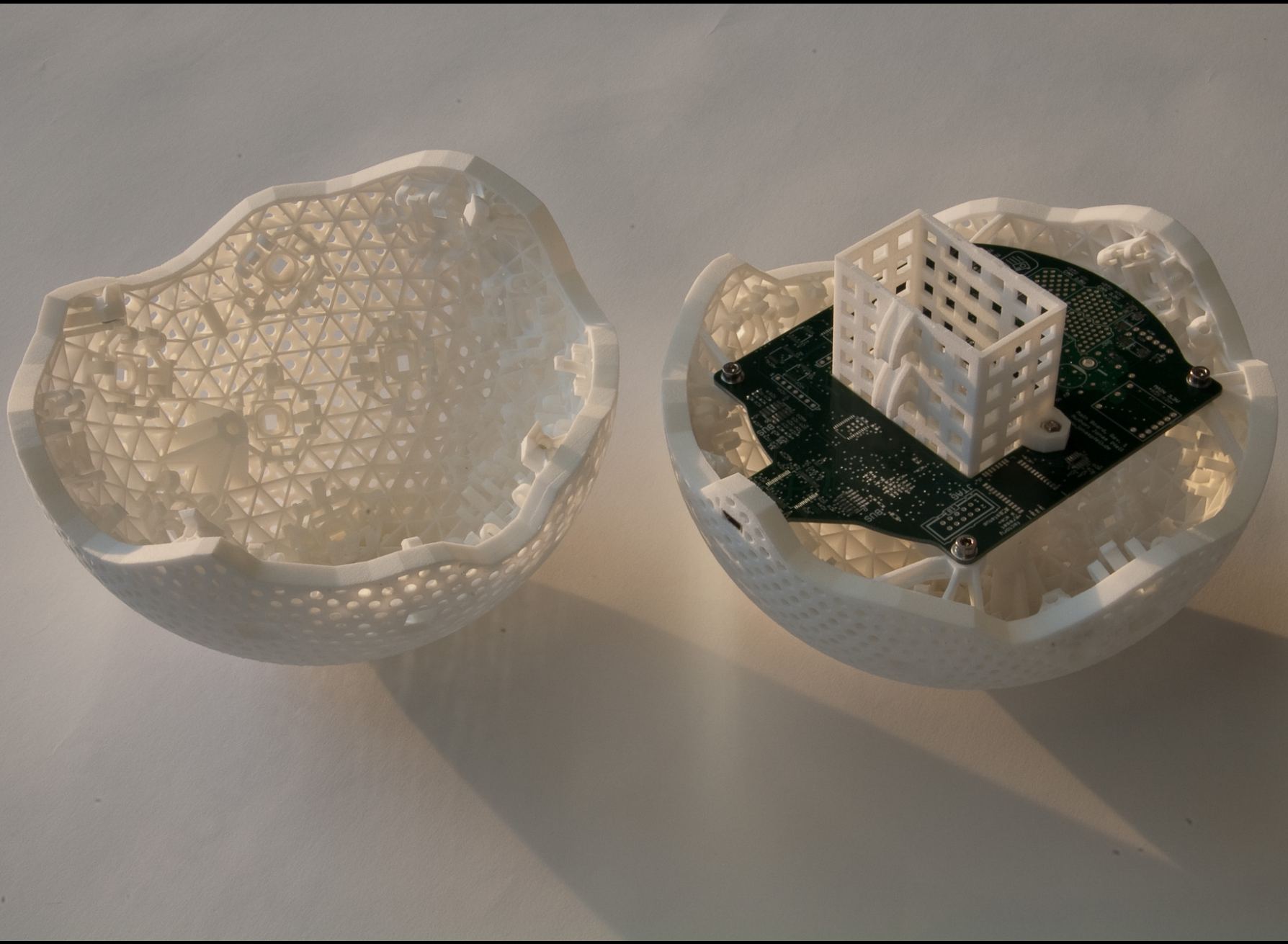
Split Line and Fasteners

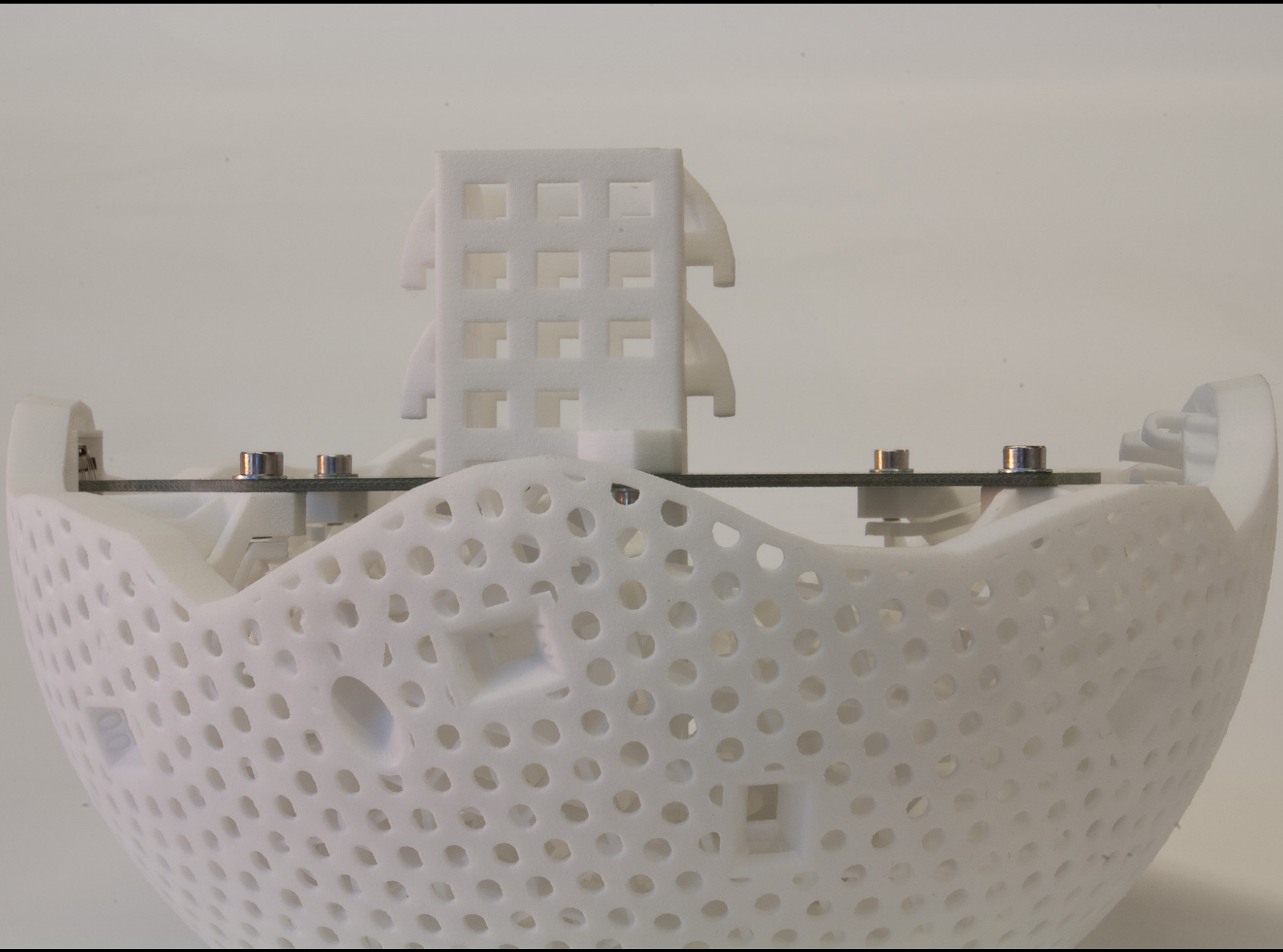


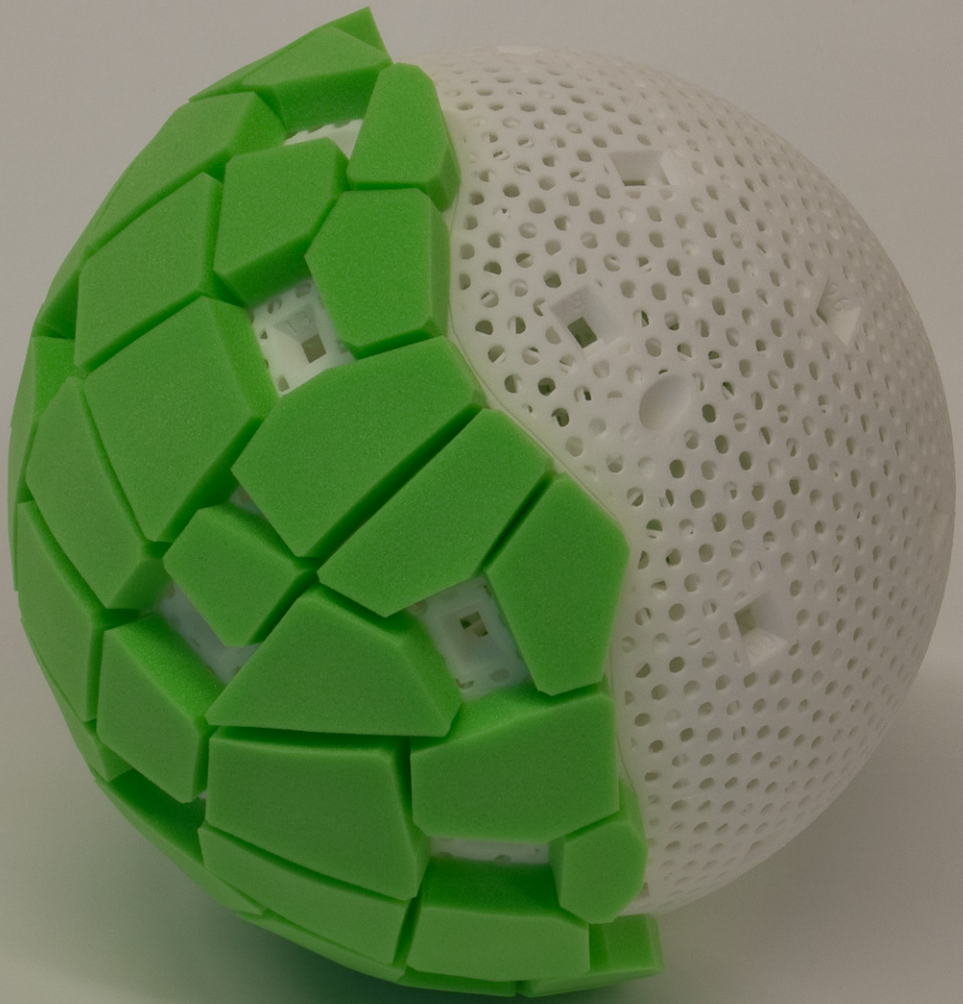
Battery Cage

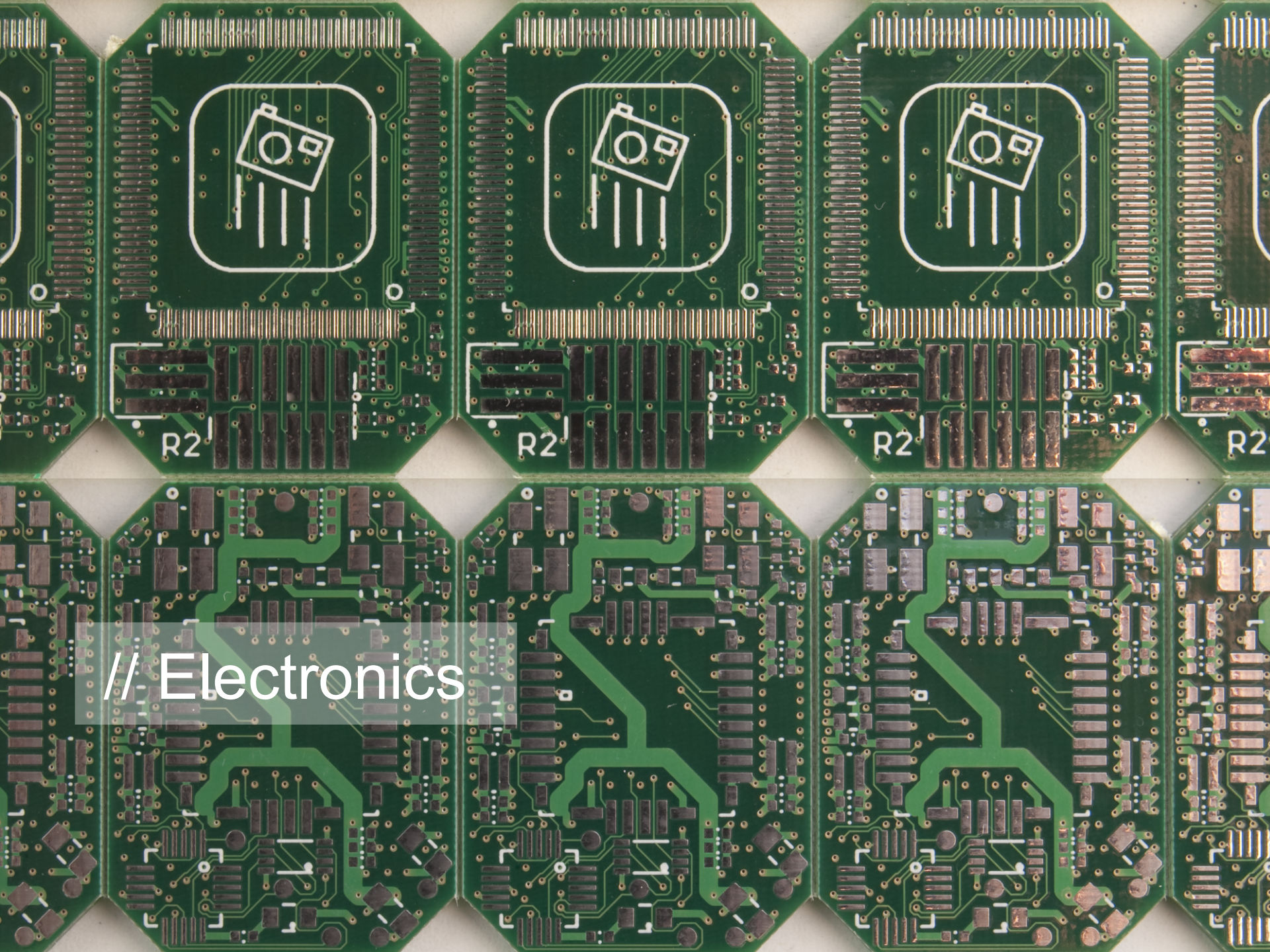




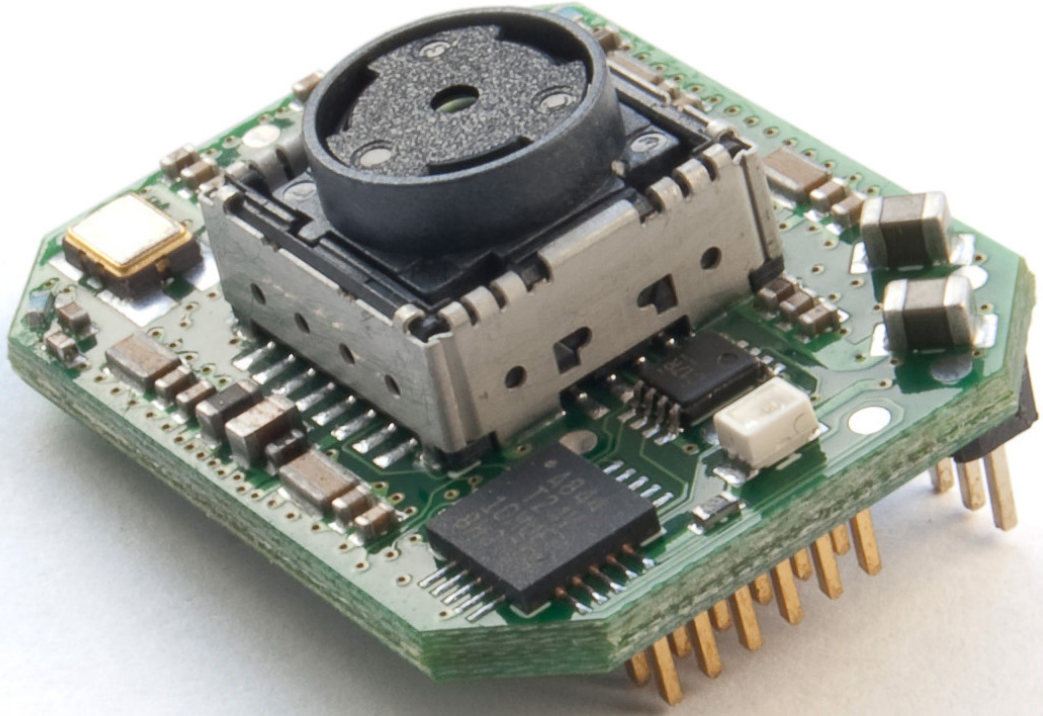


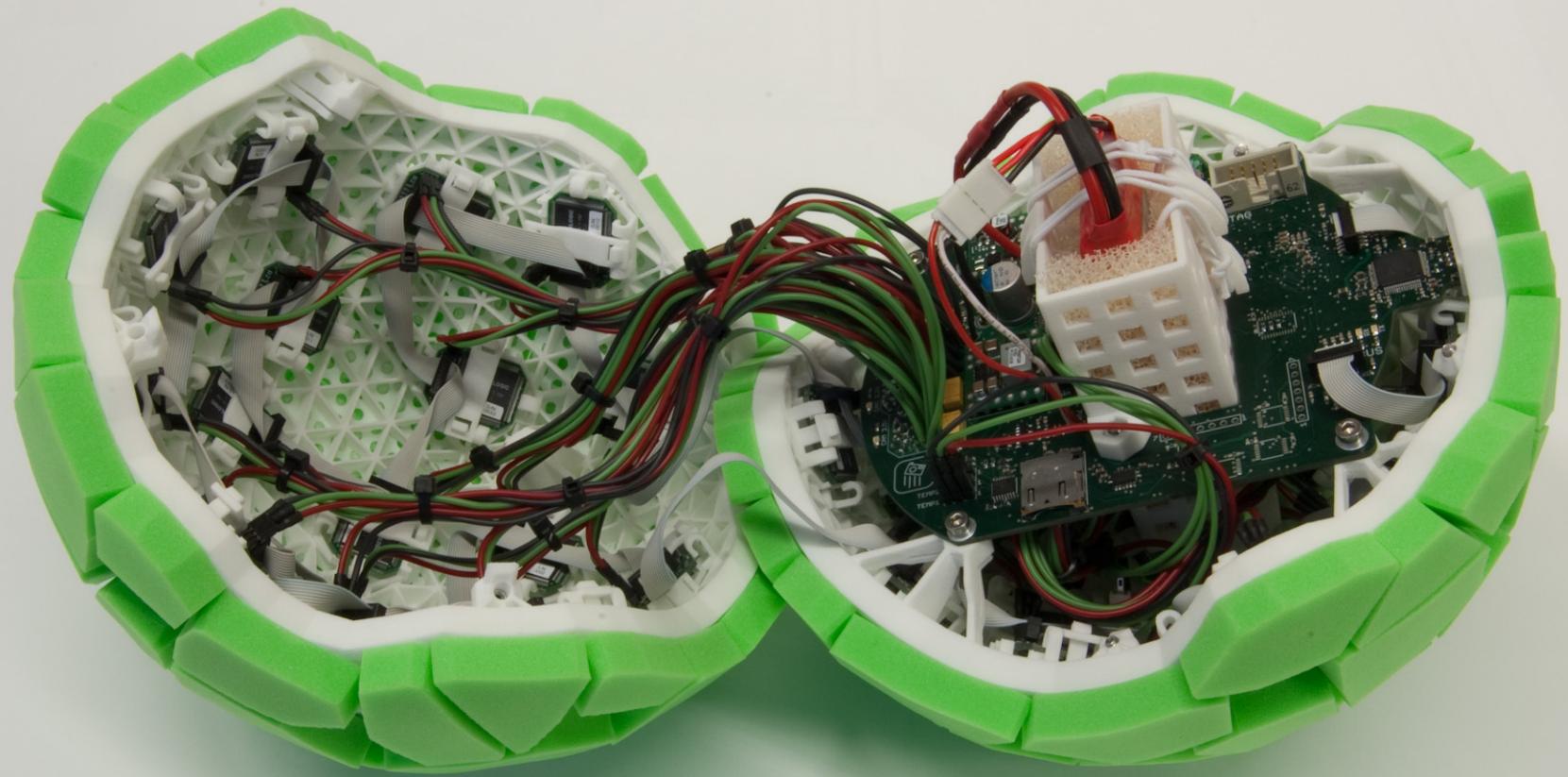





// Electronics

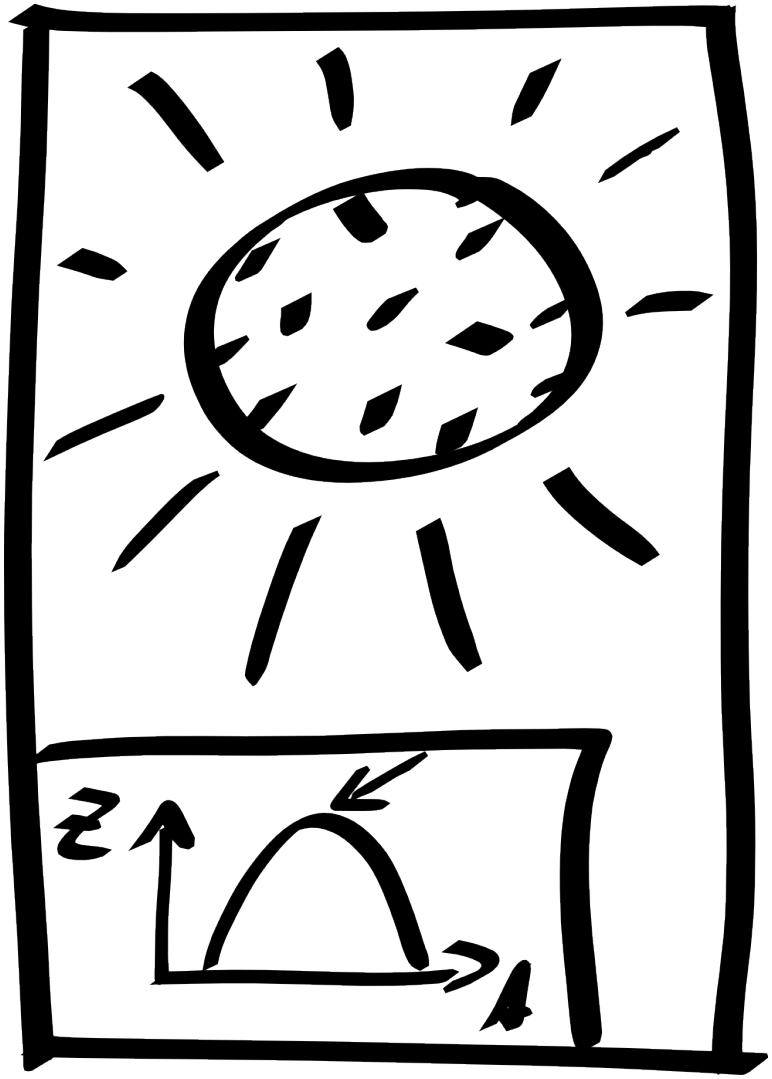
Camera Board





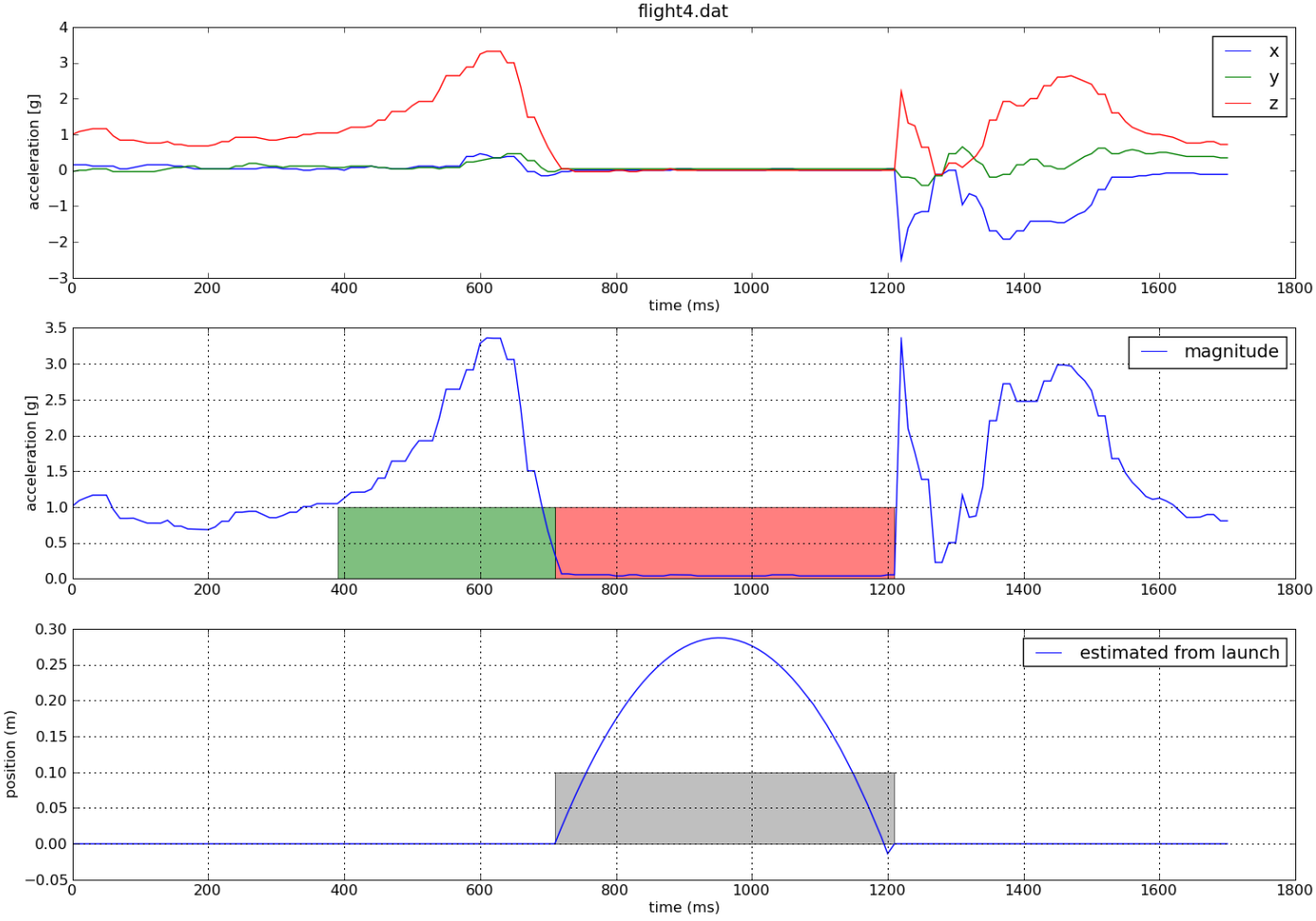
Assembled

// Calculate Peak of Flight





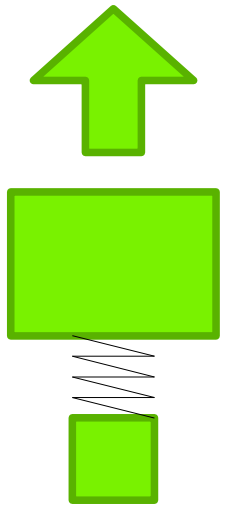
Accelerometer Data



Calculate Rise Time

- Start velocity

$$v_0 = \int a(t) - g \, dt = v_a + v'.$$



- Rise time (no air resistance)

$$v(t) = v_0 - gt. \qquad t_h = v_0/g.$$

- Rise time (with air resistance)

$$t_h = \frac{1}{\sqrt{gk}} \arctan\left(\sqrt{\frac{k}{g}} \cdot v_0\right).$$

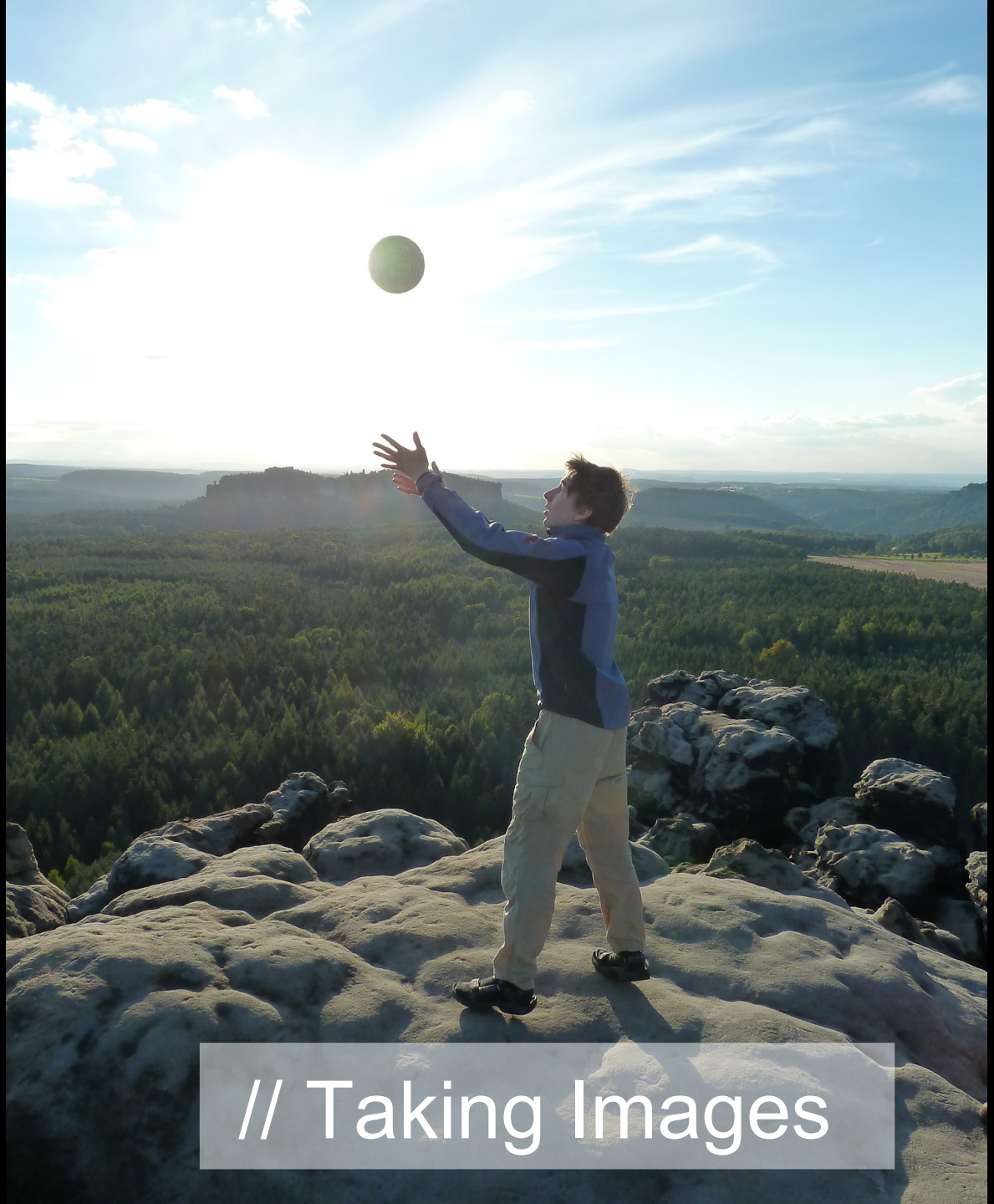


Foto: Thomas Alexander


Throw
Foto: Lutz Pfeil

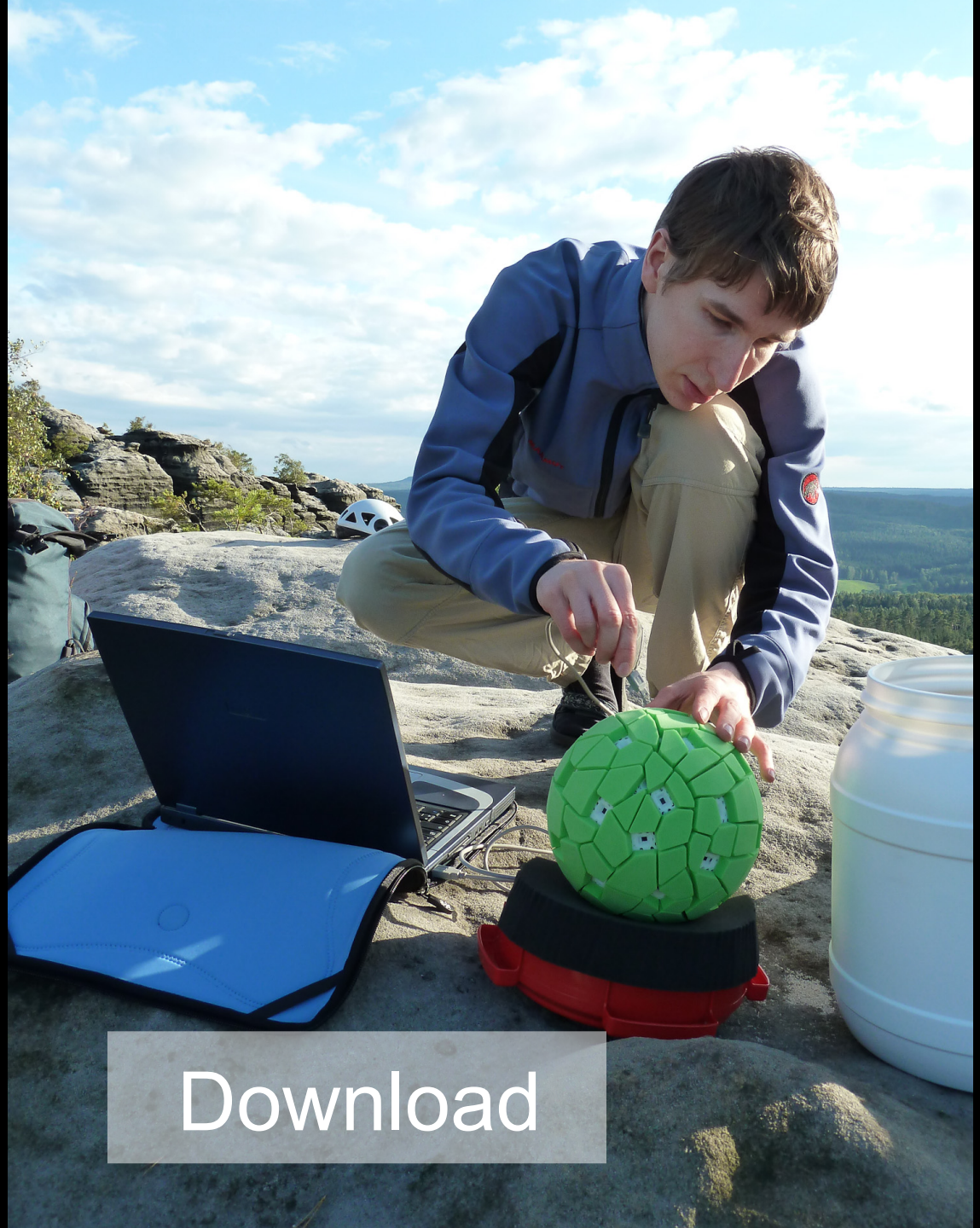
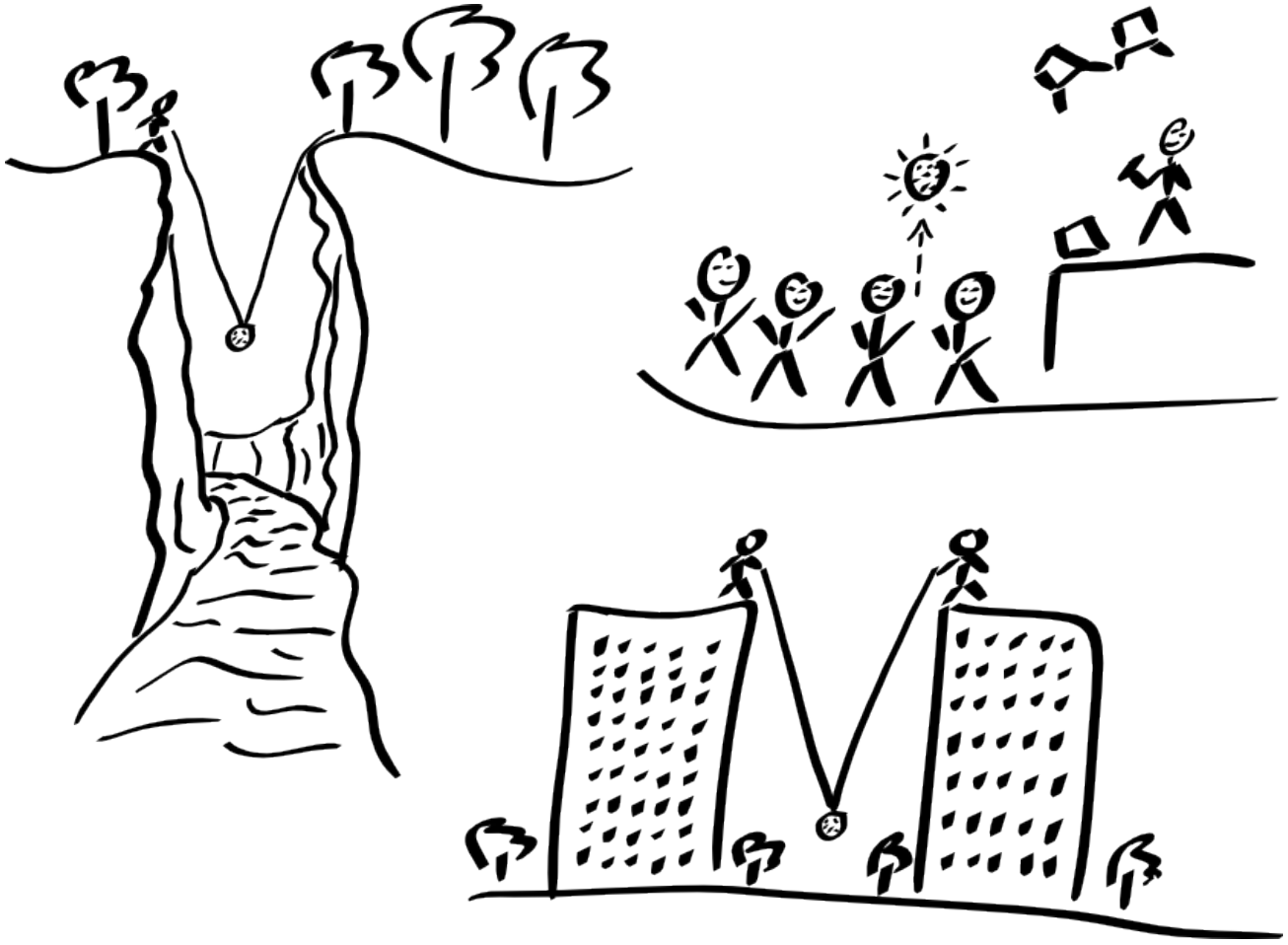
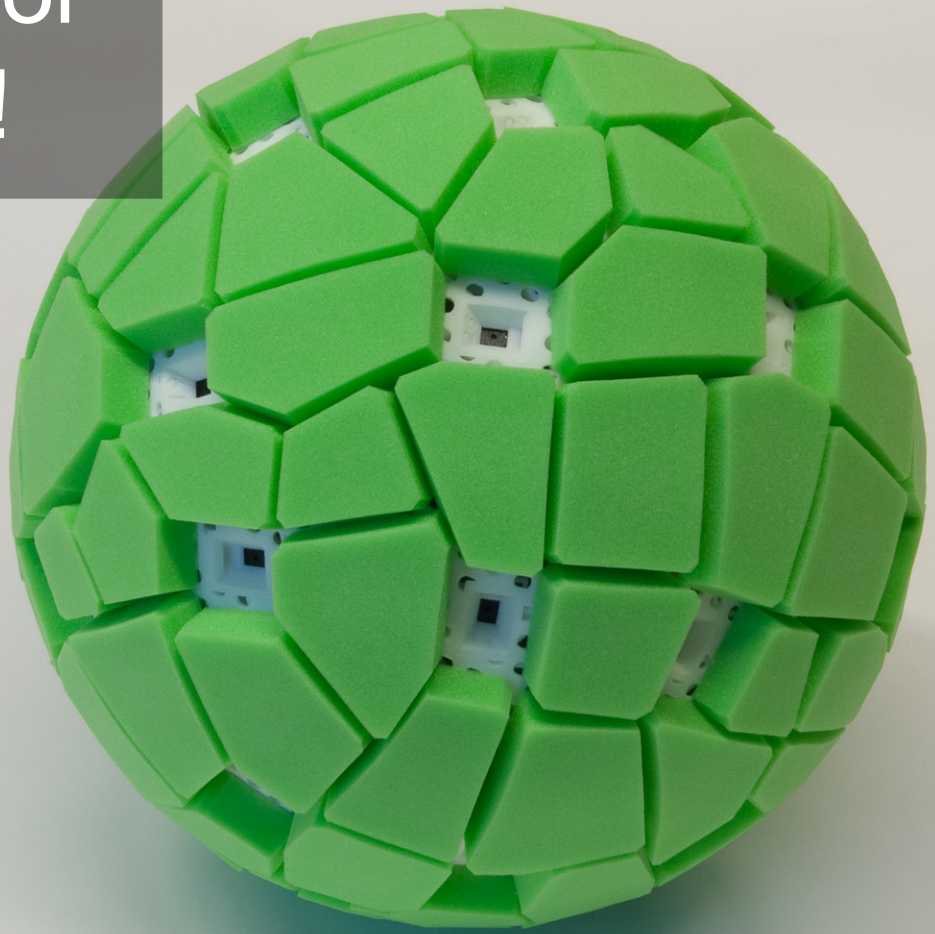


Foto: Thomas Alexander

Use cases



Thanks for listening!



www.jonaspfeil.de

Questions?