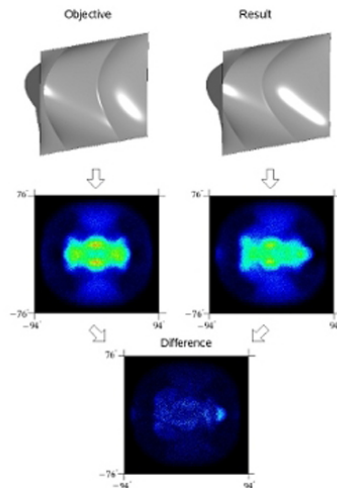


# Fast Inverse Reflector Design (FIRD)

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This paper presents a new inverse reflector design method using a GPU-based computation of outgoing light distribution from reflectors. We propose a fast method to obtain the outgoing light distribution of a parameterized reflector, and then compare it with the desired illumination. The new method works completely in the GPU. We trace millions of rays using a hierarchical height-field representation of the reflector. Multiple reflections are taken into account. The parameters that define the reflector shape are optimized in an iterative procedure in order for the resulting light distribution to be as close as possible to the

desired, user-provided one. We show that our method can calculate reflector lighting at least one order of magnitude faster than previous methods, even with millions of rays, complex geometries and light sources.