1124-05-102 **Matthew Yancey*** (mpyancey1@gmail.com). *A unique current-best algorithm to find a distance-approximating tree.*

The problem is simple: build a tree that models a fixed graph. An example application would be to build a phylogenetic tree from a list of pairs of related species. Given the original graph G and a proposed model T with a mapping $f : V(G) \to V(T)$, our objective function may be additive (minimize over T, f the value $\max_{u,v} \|d_G(u,v) - d_T(f(u), f(v))\|$) or multiplicative (minimize over T, injective f the value $\max_{u,v} \max\{d_G(u,v)/d_T(f(u), f(v)), d_T(f(u), f(v))/d_G(u,v)\}$). In either case the problem is NP-Hard. But there exists a single deterministic algorithm that constructs a model T and function f that is within a small constant of optimal for both the additive objective function and the multiplicative objective function.

In this talk we retrace the history of this algorithm, as it was discovered four distinct times in four distinct fields: (1) historical manuscripts, (2) hyperbolic geometry, (3) biology, and (4) computer vision. (Received August 31, 2016)