# Distance from a point to a convex hull and problem

**Distance from a reduced d-1 dimension point to a reduced dimension d-1 dimension region (represented as a list of d dimension vectors)**

**Given** , ,   are all d dimension column vectors

Minimize

Subject to

Where:

**is the matrix consisting of constrains (half-spaces);**

**is the point;**

**represents a half-space constrain;**

**all element of should be greater than 0, ;**

**sum of all element of should be no greater than 1,** .

**:**

Minimize subject to

**Transform between Dominate Radius and Problem:**

, ,

where is the d-dimension identity matrix.