**Function 1: \_init\_()**

Input:

* compute\_distance method

Initialization of Fast HHG independence test object for later use

**Function 2: test()**

Input:

* choice of center point
  + “center of mass”
  + “random sample point” – picks a random sample point as
  + “specified”
* Sample data matrices – both must be of the same size, but can be of different dimensional size p and q
  + X
  + Y
* Test – type of univariate test used
  + KS
  + CM
  + Hoeffding
* Centre point – default to 0
  + Used in case of ‘specified’

Process:

1. Check if sample points are of the same size
   1. Return error on fail
2. Determine center point Zx and Zy
   1. Centre of Mass = Zx is average of the sum of X and Zy is average of the sum of Y
   2. Random sample point = pick a random point in X and random point in Y, then remove them from
   3. Specified
   4. Good to return chosen center point
3. Compute distance between sample points and center point to obtain distance matrix
   1. 
4. Apply chosen univariate test to distance matrix

Output:

* Test-statistic
* P-value
* Chosen center point