SPORF Ppt Notes Objective: discover predictable patterns in high dimensional data Formal definition: let: xi E X C R, Yi E Y C R2 Given: Dn = (xi, yi) pairs for i ∈ 1,...,n assume each pair is sampled independently & identically from some joint distribution, Fx Duse Dn to obtain estimate of Frix Intuition La Intuitive Desiderata of Supervised Learning procedures
1. performant under any joint distribution
2. Is intermedial. 2. Is interpretable 3. is computationally efficient Glinear 2-way classification in 1 dimension Us brild a classifler on Dr Lytry to get all possible splits, compate the "score" for each is split on the best choice (highest score).

Lypredict the class of a new x (x) = 1 if x > threshold49 (x)=0 if x < threshold La Decision free in I dimension La builda tree on Dn Ly try all possible splits Ly compute the "score" for each (split on the best choice (highest score) Greate 2 daughter nodes repeat on daughter nodes Spredict the class Lanew x Co push down the tree Co select the plurality class for that the node a lands in G Random Forest (RF) in I dimension Grant on Dn

is subsample the data to select unkn points Ly buildatee a each Gredict the to class of a new > Copush dan each tree Coselect the phonotist plurality vote of the trees GRandom Forest in ID Gruhat 8 Lore function should I use? 6 purity Co how deep should each tree be? ras deepas possible Ghow ha any trees? G about 1000 Us how does it scale? G linearly in n, to of trees, dimension of data Gnot Hy any problems in 1D Linear 2-way classif. in 2D La build classifier on Dn Gity all possible angles Go compute the "score" for cach G split on the best choice (highestscore) Is predict the class of a new x (rg(x)=1 if x > the line (1g(x)=0 if x < He time Galecisian tree in 2D Sobrildative on in Gr for each dimension. Catryall possible splits
Compute the "score" for each
Cosplit on the best choke (his Lest score) to create 2 daughter nodes

Lypredict the class of a new X

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Lypredict the plurality class for the node Alands in

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Lypredict the class of a new X

Lypredict the class of a new X

Lypredict the plurality vote of the trees