Feature Interactions

Feature Interactions

- Consider an object having two vectors of features: ***z***,***t***.

  z – *p*-dimensional
  t – *m*-dimensional

- Interaction of feature vectors is a new feature vector ***x*** (p·m – dimensional) with pairwise products of ***z*** and ***t***.

- Consider an object having two vectors of features: $\boldsymbol{z}$,$\boldsymbol{t}$.

  $\boldsymbol{z}=[z_1, z_2]$, 2 dimensions

  $\boldsymbol{t}=[t_1, t_2, t_3, t_4]$, 4 dimensions

- **Interaction**

  $\boldsymbol{x}=[z_1t_1, z_1t_2, z_1t_3, z_1t_4, z_2t_1, z_2t_2, z_2t_3, z_2t_4]$

  8 dimensions

- Consider an object having two vectors of features: ***z***,***t***.

  z=[z_1, z_2], 2 dimensions

  t=[t_1, t_2, t_3, t_4], 4 dimensions

- **Interaction**

  x=[z_1t_1, z_1t_2, z_1t_3, z_1t_4, z_2t_1, z_2t_2, z_2t_3, z_2t_4]

  8 dimensions (**p*m dimensions**)

- **Concatenation**

  x =[z_1, z_2, t_1, t_2, t_3, t_4]

  6 dimensions (**p+m dimensions**)

- **Concatenation + Interaction**

  x=[z_1 , z_2 , t_1, t_2, t_3, t_4, z_1t_1, z_1t_2, z_1t_3, z_1t_4, z_2t_1, z_2t_2, z_2t_3, z_2t_4]

  14 dimensions (**p+m+pm dimensions**)