

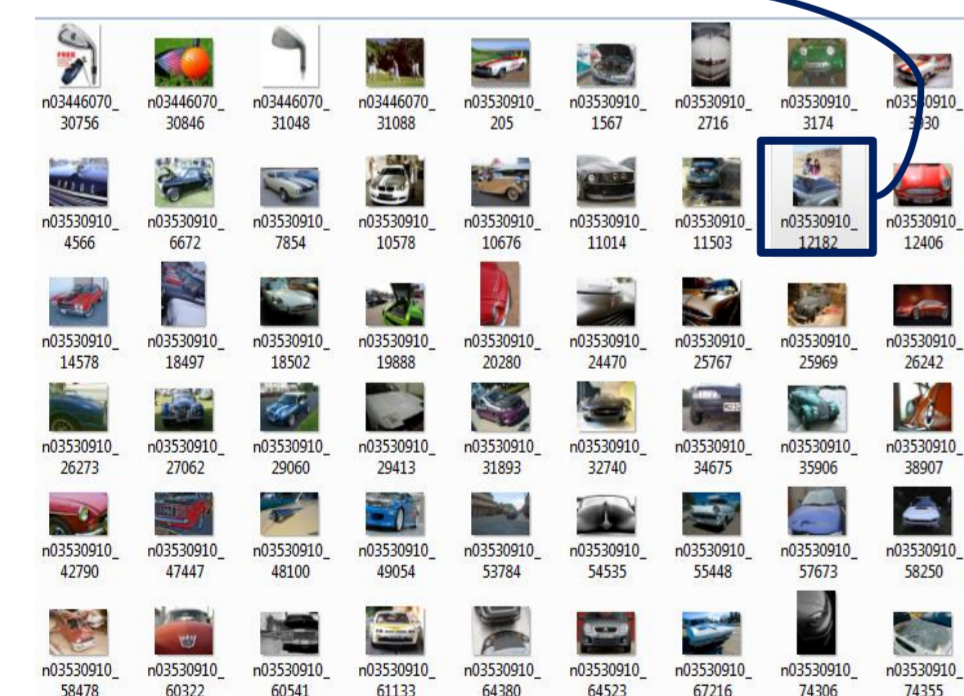
1 Motivation



If given only one photo as



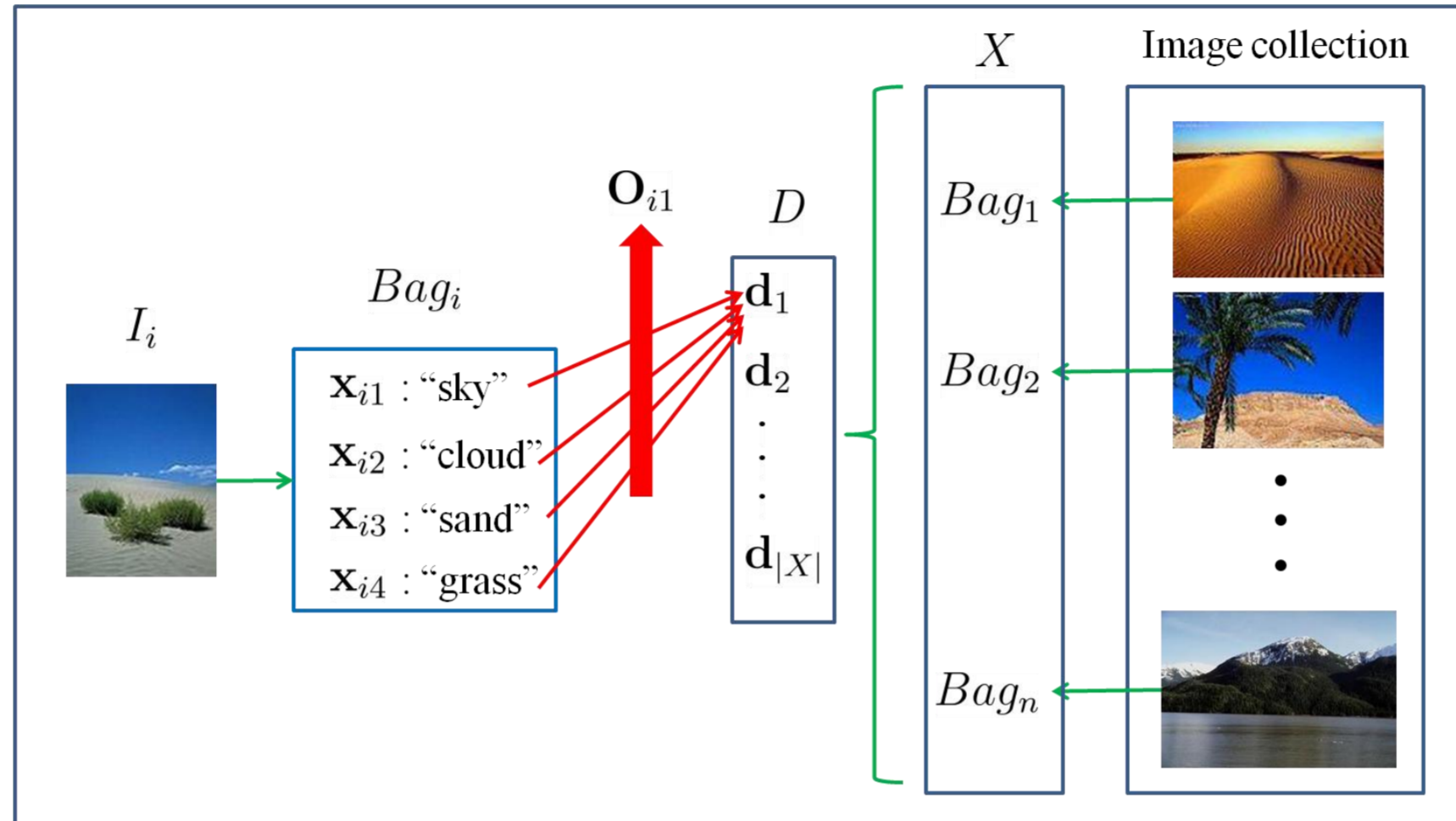
What if it is hidden in thousands of photos as



Great!
Computer will figure out what you have
Effectively and automatically!

2 Tell what you have SEMANTICALLY

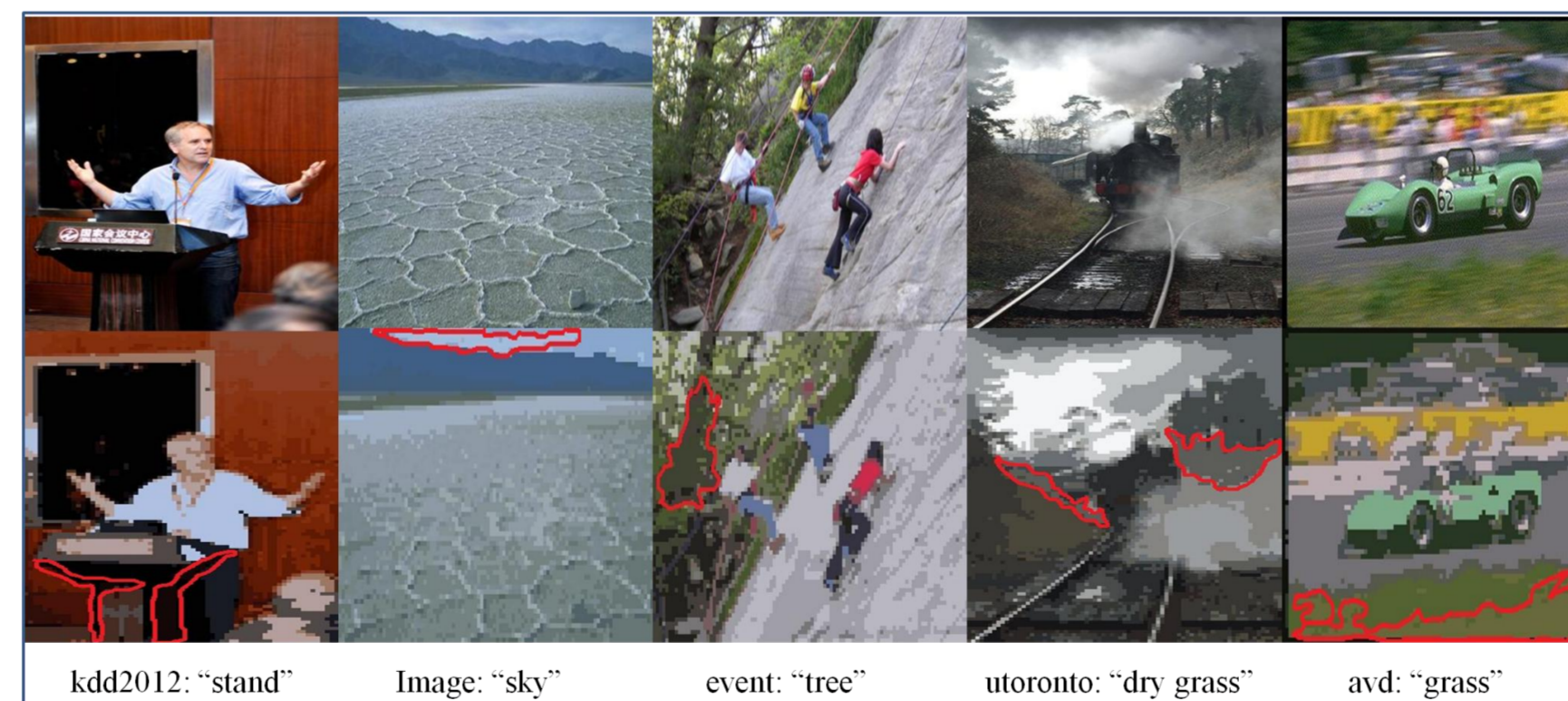
Meaningful tags for human beings like "sky"



Multi-instance multi-label learning [Zhou et al., AI 2012]
Image segmentation [Wang et al., PAMI 2001]

4 Empirical study

Example of the 1st selected dimension



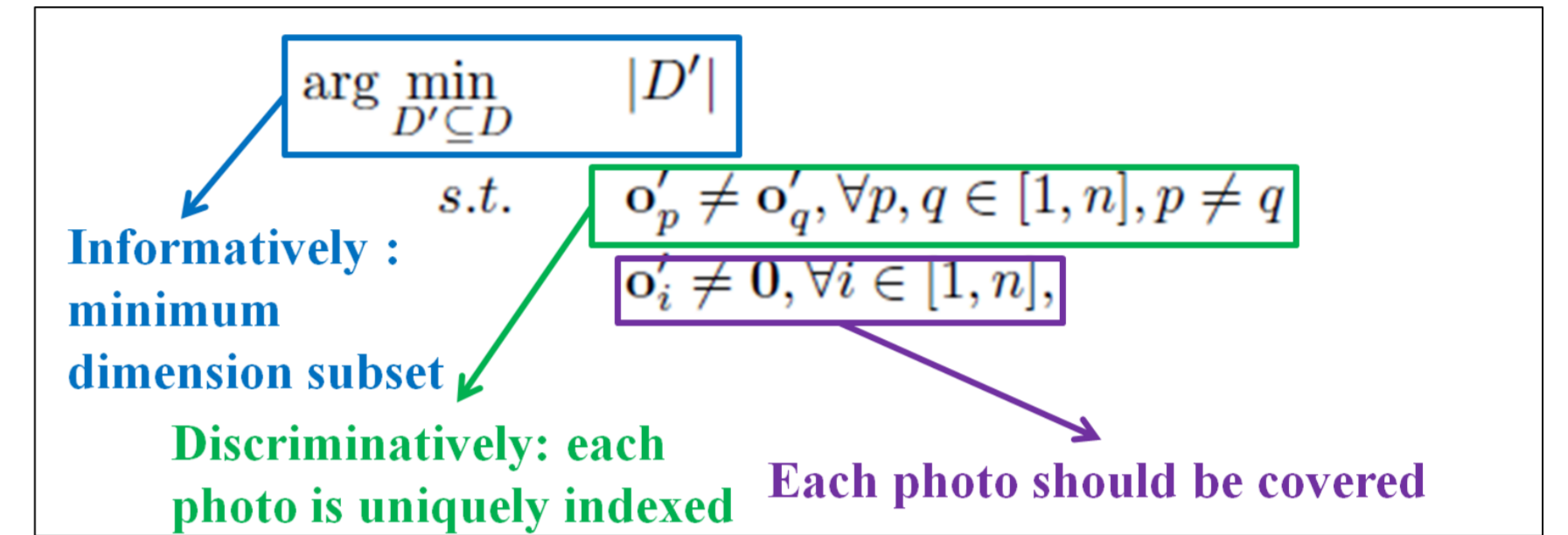
#dimensions used

Data set	#Images	#Candidates	Method			CPU time (sec)		
			Our	RSF	RSB	Our	RSF	RSB
kdd2012	1,503	20,251	64	935	20,098	54.08	61.55	211.17
Image	2,000	24,923	72	612	24,757	105.28	119.25	420.07
event	1,579	21,992	65	463	21,829	64.89	70.18	293.73
utoronto	1,998	25,116	69	812	24,976	125.37	203.34	314.07
avd	3,979	56,900	77	1,834	56,561	569.43	613.27	2,021.5

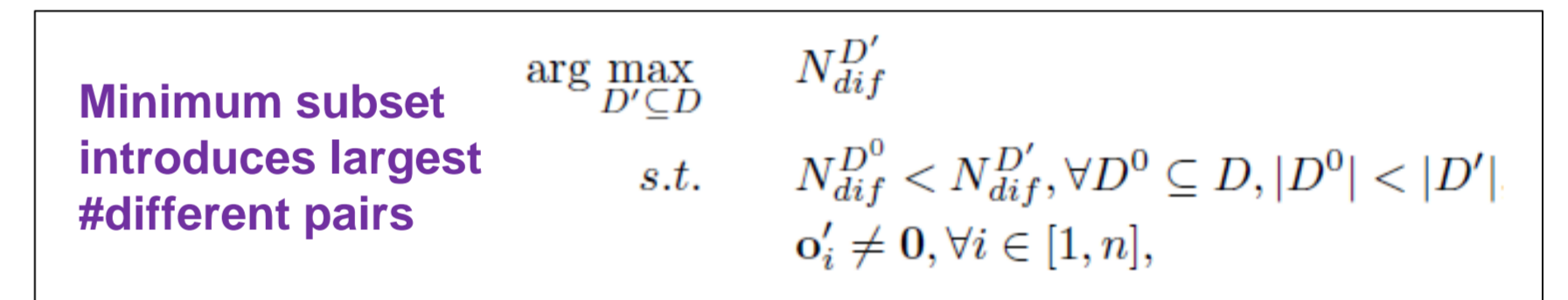
3 Tell what you have DISCRIMINATIVELY & INFORMATIVELY

Problem formulation

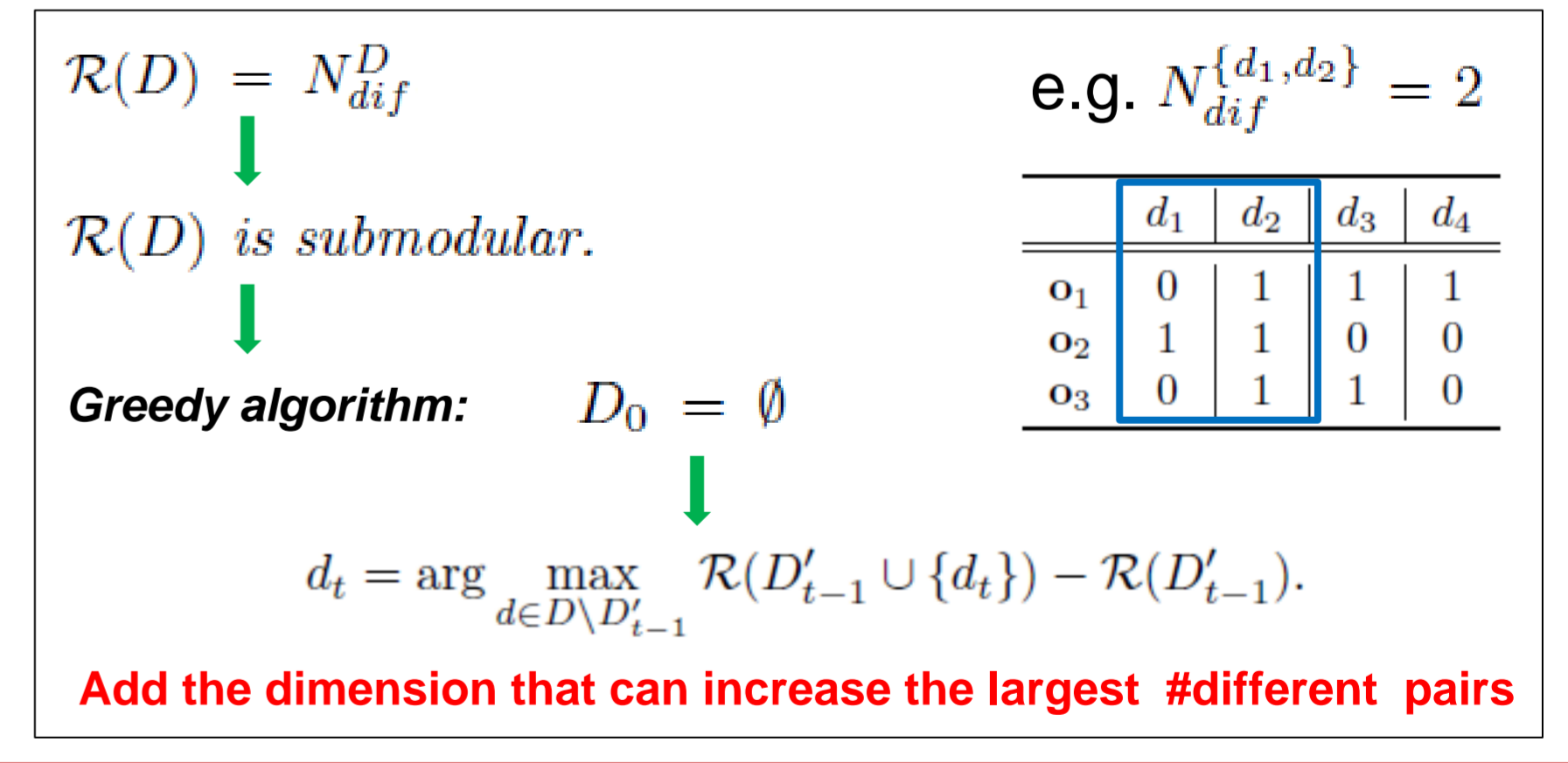
- Candidate dimension set D
- Photo representation $O \in \{0, 1\}^{n \times |D|}$
- Assume each photo is unique on D



Problem Transformation



Algorithm



5 Reference and contacts

J. Hu, J. Pei & J. Tang. SDM'14, pp.136-144.
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