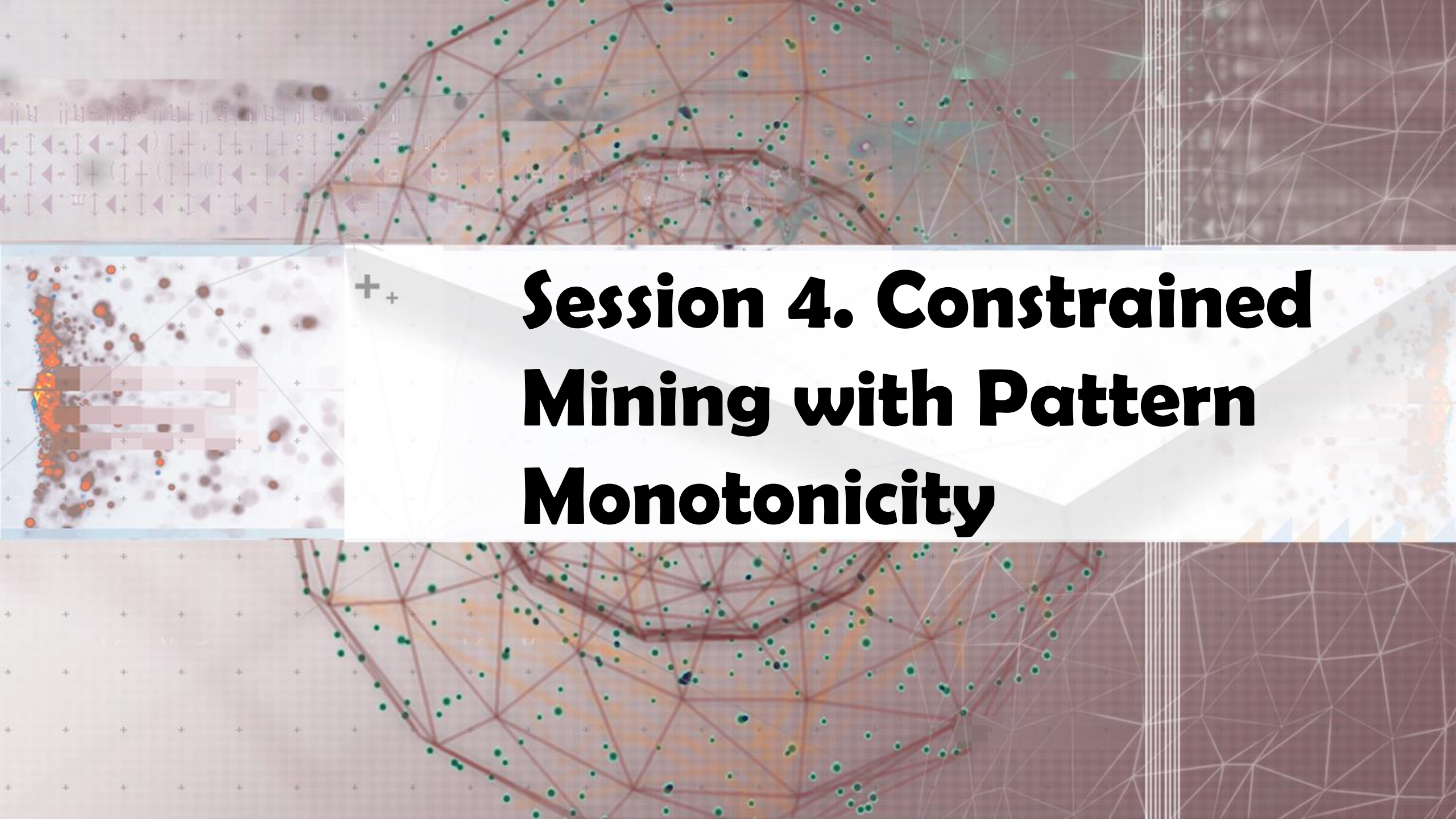

Session 4. Constrained Mining with Pattern Monotonicity

Pattern Monotonicity and Its Roles

- A constraint *c* is *monotone*: if an itemset S **satisfies** the constraint c, so does any of its superset
  - That is, we do not need to check *c* in subsequent mining
- Ex. 1: c_1: *sum(S.Price)* $\geq v$ is monotone
- Ex. 2: c_2: *min(S.Price)* $\leq v$ is monotone
- Ex. 3: c_3: range(S.profit) ≥ 15 is monotone
  - Itemset *ab* satisfies c_3
  - So does every superset of *ab*

TID	Transaction
10	a, b, c, d, f, h
20	b, c, d, f, g, h
30	b, c, d, f, g
40	a, c, e, f, g

min_sup = 2

price(item)>0

Item	Profit
a	40
b	0
c	-20
d	-15
e	-30
f	-10
g	20
h	-5