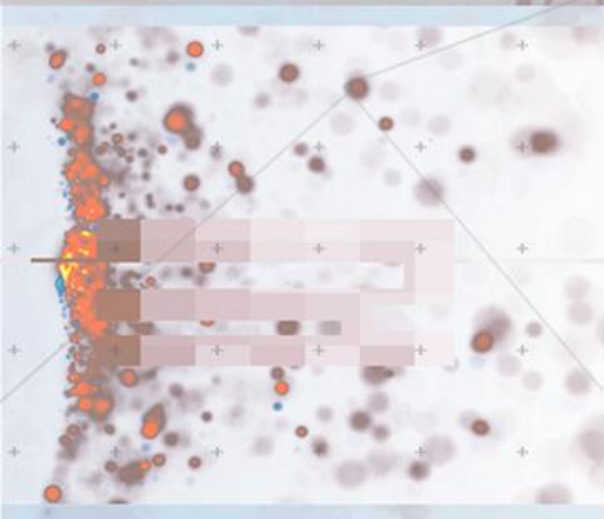


The background of the slide is a complex, abstract composition. It features a network of thin, light-colored lines forming a web-like structure. Overlaid on this are various data points and shapes: small green and blue dots, larger orange and red circular clusters, and a grid of small grey plus signs. A prominent feature is a large, semi-transparent white trapezoidal shape that serves as a backdrop for the title text. In the bottom right corner, there are faint, overlapping geometric shapes in shades of blue and orange.

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: $c_1: \text{sum}(S.\text{Price}) \geq v$ is **monotone**
- Ex. 2: $c_2: \text{min}(S.\text{Price}) \leq v$ is **monotone**
- Ex. 3: $c_3: \text{range}(S.\text{profit}) \geq 15$ is **monotone**
 - Itemset ab satisfies c_3
 - So does every superset of ab

TID	Transaction	Item	Profit
10	a, b, c, d, f, h	a	40
20	b, c, d, f, g, h	b	0
30	b, c, d, f, g	c	-20
40	a, c, e, f, g	d	-15
min_sup = 2 price(item)>0		e	-30
		f	-10
		g	20
		h	-5