

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 visualizations: a grid of small grey plus signs, a series of purple arrows pointing left, a cluster of green and blue dots, and a large, faint, reddish-brown geometric shape. In the bottom left corner, there is a small inset image showing a dense cluster of orange and red dots with a horizontal band of pink and white squares.

# **Session 5. Constrained Mining with Data Anti-Monotonicity**

# Data Space Pruning with Data Anti-Monotonicity

- A constraint  $c$  is **data anti-monotone**: In the mining process, if a data entry  $t$  cannot satisfy a pattern  $p$  under  $c$ ,  $t$  cannot satisfy  $p$ 's superset either
- Data space pruning: Data entry  $t$  can be pruned
- Ex. 1:  $c_1: \text{sum}(S.\text{Price}) \geq v$  is **data anti-monotone**
- Ex. 2:  $c_2: \text{min}(S.\text{Price}) \leq v$  is **data anti-monotone**
- Ex. 3:  $c_3: \text{range}(S.\text{profit}) \geq 25$  is **data anti-monotone**
- Attention: Exploring recursive data space pruning

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
		e	-30
		f	-10
		g	20
		h	-5

min\_sup = 2

price(item) > 0

Data space pruning in the FP-growth mining process:

