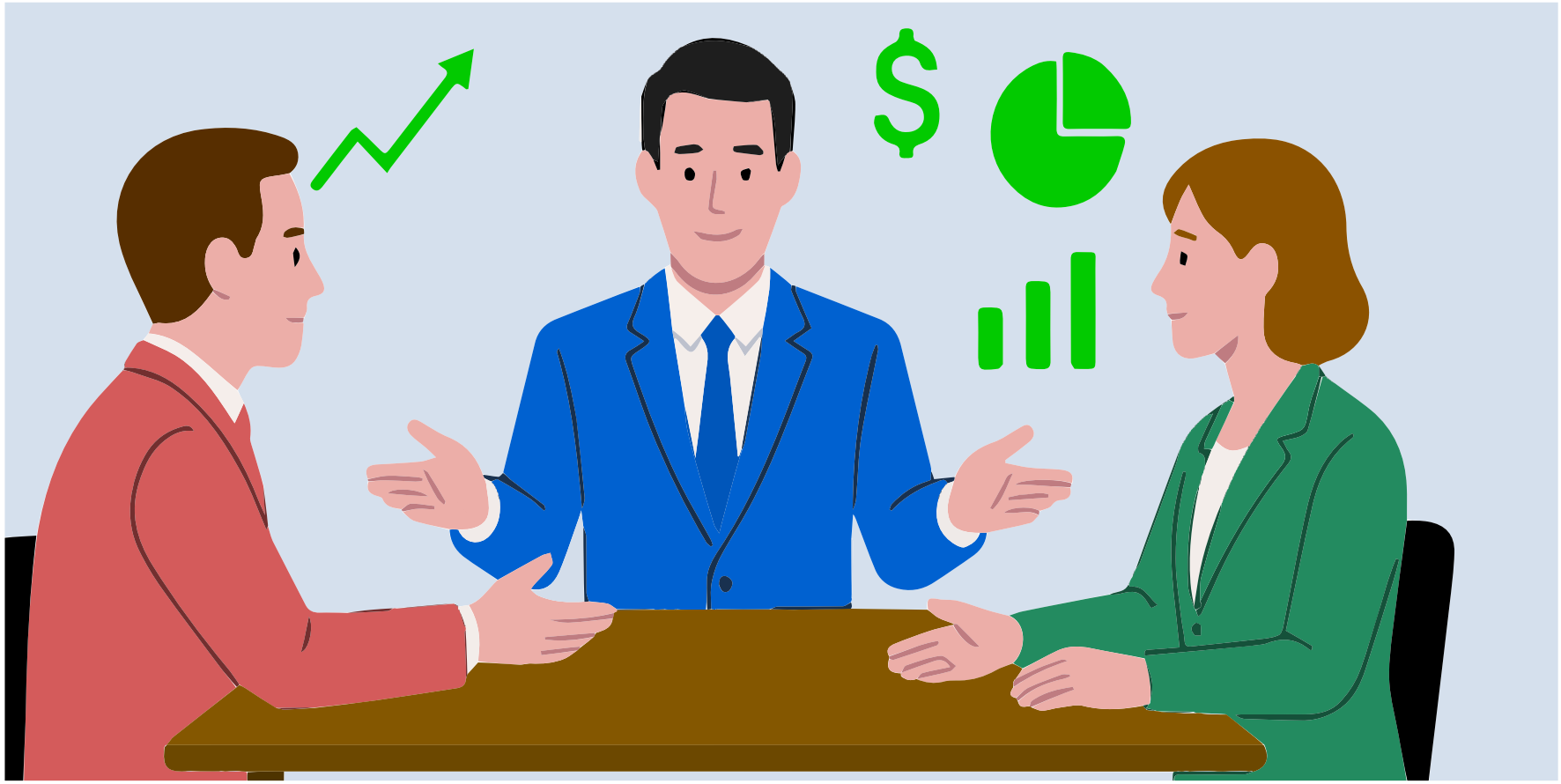


A Parametric Contextual Online Learning Theory of Brokerage

François Bachoc, **Tom Cesari**, Roberto Colomboni

ICML 2025

Shell price: **0.6$**

My valuation is **0.2$**

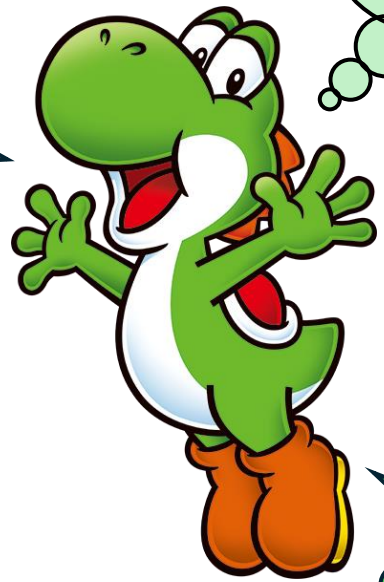
My valuation is **0.7$**

Deal!

I want to **sell** at **0.6$**

My valuation was **0.2$**

Mario



I want to **buy** at **0.6$**

My valuation was **0.7$**

Yoshi

Context

REWARD

Gain from trade:

$$\mathrm{GFT}(p, v, w) := \Big(\underbrace{(v \vee w - p)}_{\text{buyer's utility}} + \underbrace{(p - v \wedge w)}_{\text{seller's utility}} \Big) \cdot \underbrace{\mathbb{I}\{v \wedge w \leq p \leq v \vee w\}}_{\text{a trade happens}}$$

$$= (v \vee w - v \wedge w) \cdot \mathbb{I}\{v \wedge w \leq p \leq v \vee w\}$$

RESULTS

	Bounded density	General
2-bit feedback	$\sqrt{LdT}$	T
Full feedback	$Ld \log T$	T