Inferencing intersection types ?

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This morning

This morning I will try to dissolve the malaise between the two present communities.

Are intersections binary infs ?

A very simple type system with subtyping

$$s, t := \quad \bot \quad | \quad \top \quad | \quad s \times t \quad | \quad s \to t$$

$$\frac{}{\bot \leq s} \qquad \frac{}{s \leq \top} \qquad \frac{s_1 \leq s_2 \qquad t_1 \leq t_2}{s_1 \times t_1 \leq s_2 \times t_2} \qquad \frac{s_1 \geq s_2 \qquad t_1 \leq t_2}{s_1 \to t_1 \leq s_2 \to t_2}$$

Intersection and union as inf and sup

$$\bot \vee t := \bot \qquad \top \vee t := t \qquad (s_1 \times t_1) \vee (s_2 \times t_2) := (s_1 \vee s_2) \times (t_1 \vee t_2)$$

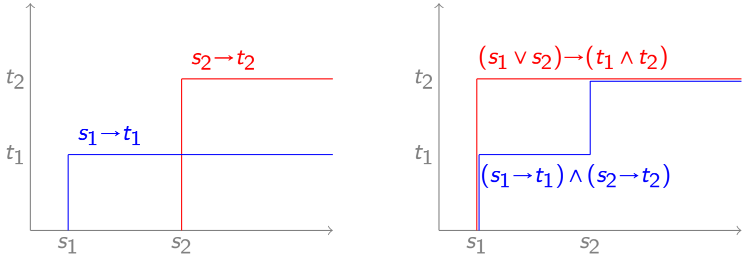
$$\bot \wedge t := t \qquad \top \wedge t := \top \qquad (s_1 \times t_1) \wedge (s_2 \times t_2) := (s_1 \vee s_2) \times (t_1 \vee t_2)$$

$$(s_1 \to t_1) \vee (s_2 \to t_2) \;:=\; (s_1 \wedge s_2) \to (t_1 \vee t_2)$$

$$(s_1 \to t_1) \wedge (s_2 \to t_2) \;:=\; (s_1 \vee s_2) \to (t_1 \wedge t_2)$$

⚠ Underapproximation in a functional semantics ⚠

Underapproximation in a functional semantics ?



⚠ By stone duality, inf of type corresponds to sup of function

Unions are fine but intersections are different

$$\frac{\vdash M : s \qquad \vdash M : t}{\vdash M : s \wedge t}$$ do not happen in general

What about GoGITARe

Resource analysis via types needs subtyping

In order to do good analysis, one have to abstract and approximate resources
Our subtyping reflects **knowledge** over the type.

(Partial) Inference is a must

We only want the "best available result" not the "absolute best"...

Intersection are bound to happen

Catching non-uniform behaviour will leads to use finite intersections types (in the semantics sense...).