anti-sèche tuto argumentation kr18 srdjan vesic

Extension-based semantics:
S is *conflict-free* (CF) if there are no $a, b \in S$ such that $(a, b) \in R$.
S *defends* a if for each $b \in A$, if $(b, a) \in R$ then b is attacked by S.
S is *admissible* if it is CF and each argument of S is defended by S.
S is a *complete* extension if it is admissible and every argument defended by S belongs to S.
S is a *preferred* extension if it a is maximal (for $\subseteq$) admissible set.
S is a *stable* extension if it is CF and attacks all the arguments that do not belong to S.
S is a *grounded* extension if it is the min. (for $\subseteq$) complete extension.
Principles for ranking-based semantics:
$\mathtt{S}$ satisfies *anonymity* iff, for any two WAGs $\mathtt{G} = \langle \mathcal{A}, w, \mathcal{R} \rangle$ and $\mathtt{G}' = \langle \mathcal{A}', w', \mathcal{R}' \rangle$, for any isomorphism f from $\mathtt{G}$ to $\mathtt{G}'$, the following property holds: $\forall\, a \in \mathcal{A}, \mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(a) = \mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}'}(f(a))$.
$\mathtt{S}$ satisfies *independence* iff, for any two WAGs $\mathtt{G} = \langle \mathcal{A}, w, \mathcal{R} \rangle$ and $\mathtt{G}' = \langle \mathcal{A}', w', \mathcal{R}' \rangle$ s.t. $\mathcal{A} \cap \mathcal{A}' = \emptyset$, the following holds: $\forall\, a \in \mathcal{A},\ \mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(a) = \mathtt{Deg}^{\mathtt{S}}_{\mathtt{G} \oplus \mathtt{G}'}(a)$.
$\mathtt{S}$ satisfies *directionality* iff, for any two WAGs $\mathtt{G} = \langle \mathcal{A}, w, \mathcal{R} \rangle$, $\mathtt{G}' = \langle \mathcal{A}, w, \mathcal{R}' \rangle$ s.t. $\mathcal{R}' = \mathcal{R} \cup \{(a, b)\}$, it holds that: $\forall x \in \mathcal{A}$, if there is no path from b to x, then $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(x) = \mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}'}(x)$.
$\mathtt{S}$ satisfies *neutrality* iff, for any WAG $\mathtt{G} = \langle \mathcal{A}, w, \mathcal{R} \rangle$, $\forall a, b \in \mathcal{A}$, if i) $w(a) = w(b)$, and ii) $\mathtt{Att}_{\mathtt{G}}(b) = \mathtt{Att}_{\mathtt{G}}(a) \cup \{x\}$ with $x \in \mathcal{A} \setminus \mathtt{Att}_{\mathtt{G}}(a)$ and $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(x) = 0$, then $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(a) = \mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(b)$.
$\mathtt{S}$ satisfies *equivalence* iff, for any WAG $\mathtt{G} = \langle \mathcal{A}, w, \mathcal{R} \rangle$, $\forall a, b \in \mathcal{A}$, if i) $w(a) = w(b)$, and ii) there exists a bijective function f from $\mathtt{Att}_{\mathtt{G}}(a)$ to $\mathtt{Att}_{\mathtt{G}}(b)$ s.t. $\forall x \in \mathtt{Att}_{\mathtt{G}}(a)$, $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(x) = \mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(f(x))$, then $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(a) = \mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(b)$.
$\mathtt{S}$ satisfies *maximality* iff, for any WAG $\mathtt{G} = \langle \mathcal{A}, w, \mathcal{R} \rangle$, $\forall a \in \mathcal{A}$, if $\mathtt{Att}_{\mathtt{G}}(a) = \emptyset$, then $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(a) = w(a)$.
$\mathtt{S}$ satisfies *weakening* iff, for any WAG $\mathtt{G} = \langle \mathcal{A}, w, \mathcal{R} \rangle$, $\forall a \in \mathcal{A}$, if i) $w(a) > 0$, and ii) $\exists b \in \mathtt{Att}_{\mathtt{G}}(a)$ s.t. $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(b) > 0$, then $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(a) < w(a)$.
$\mathtt{S}$ satisfies *counting* iff, for any WAG $\mathtt{G} = \langle \mathcal{A}, w, \mathcal{R} \rangle$, $\forall a, b \in \mathcal{A}$, if i) $w(a) = w(b)$, ii) $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(a) > 0$, and iii) $\mathtt{Att}_{\mathtt{G}}(b) = \mathtt{Att}_{\mathtt{G}}(a) \cup \{y\}$ with $y \in \mathcal{A} \setminus \mathtt{Att}_{\mathtt{G}}(a)$ and $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(y) > 0$, then $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(a) > \mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(b)$.
$\mathtt{S}$ satisfies *weakening soundness* iff, for any WAG $\mathtt{G} = \langle \mathcal{A}, w, \mathcal{R} \rangle$, $\forall a \in \mathcal{A}$ s.t. $w(a) > 0$, if $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(a) < w(a)$, then $\exists b \in \mathtt{Att}_{\mathtt{G}}(a)$ s.t. $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(b) > 0$.
$\mathtt{S}$ satisfies *reinforcement* iff, for any WAG $\mathtt{G} = \langle \mathcal{A}, w, \mathcal{R} \rangle$, $\forall a, b \in \mathcal{A}$, if i) $w(a) = w(b)$, ii) $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(a) > 0$ or $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(b) > 0$, iii) $\mathtt{Att}_{\mathtt{G}}(a) \setminus \mathtt{Att}_{\mathtt{G}}(b) = \{x\}$, iv) $\mathtt{Att}_{\mathtt{G}}(b) \setminus \mathtt{Att}_{\mathtt{G}}(a) = \{y\}$, and v) $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(y) > \mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(x)$, then $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(a) > \mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(b)$.
$\mathtt{S}$ satisfies *resilience* iff, for any WAG $\mathtt{G} = \langle \mathcal{A}, w, \mathcal{R} \rangle$, $\forall a \in \mathcal{A}$, if $w(a) > 0$, then $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(a) > 0$.
$\mathtt{S}$ satisfies *proportionality* iff, for any WAG $\mathtt{G} = \langle \mathcal{A}, w, \mathcal{R} \rangle$, $\forall a, b \in \mathcal{A}$ s.t. i) $\mathtt{Att}_{\mathtt{G}}(a) = \mathtt{Att}_{\mathtt{G}}(b)$, ii) $w(a) > w(b)$, and iii) $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(a) > 0$ or $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(b) > 0$, then $\mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(a) > \mathtt{Deg}^{\mathtt{S}}_{\mathtt{G}}(b)$.
Weighted h-categorizer:

$$\mathtt{f}^i_h(a) = \begin{cases} w(a) & \text{if } i = 0; \\ \frac{w(a)}{1 + \sum_{b_i \in \mathtt{Att}(a)} \mathtt{f}^{i-1}_h(b_i)} & \text{otherwise.} \end{cases}$$

TB semantics:

$$f^{TB}_i(a) = \frac{1}{2} f^{TB}_{i-1}(a) + \frac{1}{2} \min[w(a), 1 - \max_{b \in \mathtt{Att}(a)} f^{TB}_{i-1}(b)]$$

with $f^{TB}_0(a) = w(a)$

Simple product semantics (SAF):

$$\mathtt{Deg}(a)^{SAF}_{\mathtt{G}} = \tau(a) \cdot (1 - (\mathtt{Deg}^{SAF}_{\mathtt{G}}(b_1) \curlyvee \ldots \curlyvee \mathtt{Deg}(b_n)^{SAF}_{\mathtt{G}}))$$

where, $\mathtt{Att}(a) = \{b_1 \ldots b_n\}$, and $x \curlyvee y = x + y - x \cdot y$

DF-QuaD:

$$\mathtt{Deg}(a) = w(a) \cdot \prod_{b \in \mathtt{Att}(a)} (1 - \mathtt{Deg}(b))$$

Translating an extension-based semantics into a ranking-based semantics: (1) $a \succeq b$ iff $w(a) \geq w(b)$. (2) Obtain a new attack relation $\mathcal{R}'$ by deleting the attacks from a to b s.t. $b \succ a$. (3) Apply Dung's semantics on $\langle \mathcal{A}, \mathcal{R}' \rangle$. Then: if a belongs to all extensions, $\mathtt{Deg}(a) = 1$; else, if a belongs to at least one extension, $\mathtt{Deg}(a) = 0.5$; else, if a is not attacked by any extension, $\mathtt{Deg}(a) = 0.3$; else, $\mathtt{Deg}(a) = 0$.