COMBINING TOULMIN LAYOUTS

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Stephen Toulmin's 'layout of arguments' can represent deductive inference, but also encompasses defeasible reasoning [1]. Its simplest form is a derivation of claim C, from data D, in accordance with warrant W. The layout is usually represented graphically, but may be thought of as a triple, $\langle D, W, C\rangle$. The greater generality is made explicit by the additional elements: a further triple $\langle B, Q, R\rangle$ associated with the warrant. The warrant is justified by appeal to backing B, possible exceptions or rebuttals R are accommodated, and qualifier Q expresses the resultant strength. Hence the full layout may be understood as 'Given that D, we can Q claim that C, since W (on account of B), unless R'. We shall write this as $\langle D, W\langle B, Q, R\rangle, C\rangle$, where each component represents a set of propositions, except Q, a single term.

A significant limitation of this approach is that every argument is treated as a single step, although the fine-grained analysis of complex arguments would require the combination of multiple steps. We propose treating networks of layouts $\langle D_i, W_i\langle B_i, Q_i, R_i\rangle, C_i\rangle$ as digraphs in which D_i and C_i label vertices and W_i label edges. We show that any such network is reducible to a single layout, defined as follows:

$$\left\langle \bigcup_{\mathrm{in}(D_i)=0} D_i,\ \bigcup_i W_i \left\langle \bigcup_i B_i, \mathrm{lub}\bigcup_i Q_i, \bigvee_i R_i \right\rangle,\ \bigcup_{\mathrm{out}(C_i)=0} C_i \right\rangle$$

(Presuming that qualifiers may be partially ordered by strength, and that every pair has a least upper bound.) We also show how this account may be extended to include layouts as data (or claims) in other layouts.

REFERENCES

[1] Stephen Toulmin, ***The Uses of Argument***, Cambridge University Press, 1958.

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