

Refutation of descriptive unions in descriptively near sets

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Abstract: We evaluate an intersection operator named descriptive union for descriptively near sets. A proof of seven properties contains two trivial tautologies and the rest as *not* tautologous. This refutes the descriptive intersection operator and descriptively near sets on which it is based. This also casts doubt on the derived slug of math and physics papers as spawned at arxiv, researchgate, and vixra.

We assume the method and apparatus of Meth8/VL4 with Tautology as the designated *proof* value, **F** as contradiction, N as truthity (non-contingency), and C as falsity (contingency). For results, the 16-valued truth table is row-major and horizontal, or repeating fragments of 128-tables, sometimes with table counts, for more variables. (See ersatz-systems.com.)

LET p, q, r, s, t, u, v, w, x, y, z:
 lc_phi φ, uc_Phi Φ, A, B, lc_pi π, K, R^n, 2^K, x, y, (q&(r&s));
 ~ Not, ¬; + Or, ∨, ∪; - Not Or; & And, ∧, ∩; \ Not And;
 > Imply, greater than, →, ⊃, ⊇; < Not Imply, less than, ∈
 = Equivalent, ≡, ≐, :=, ⇔, ↔; @ Not Equivalent, ≠;
 % possibility, for one or some, ∃, ∅, M; # necessity, for every or all, ∀, □, L;
 (z=z) T as tautology; (z@z) F as contradiction, ⊘;
 (%z<#z) C as contingency, Δ, ordinal 1;
 (%z>#z) N as non-contingency, ∇, ordinal 2;
 ~(y < x) (x ≤ y), (x ⊆ y).

From: Ahmad, M.Z.; Peters, J.F. (2018).

Descriptive unions: a fibre bundle characterization of the union of descriptively near sets.
 arxiv.org/pdf/1811.11129.pdf ahmadmz@myumanitoba.ca james.peters3@umanitoba.ca

Definition 3: ... r_ϕ is the descriptive intersection. ...

Theorem 1. Let $A, B \subset K$ be two subsets of a set $K, \phi : 2K \rightarrow R^n$ be the probe function and $\pi : R^n \rightarrow 2K$ be a map such that $\pi : x \mapsto \{y \in K : \phi(y) = x\}$. Then, $A r_\phi B$ has [the] following properties: (1.0.1)

$$\begin{aligned}
 & (((r < u) \& (s < u)) > ((p = (w > v)) \& (t = (v > w)))) > (t = (x > ((y < u) > ((p \& y) = x)))) \\
 & > (z = (q \& (r \& s))) ; \\
 & \mathbf{FFFF\ FFFF\ FFFF\ FFTT} (4), \mathbf{FTFT\ FTFT\ FTFT\ FFTT} (3), \\
 & \mathbf{FTTF\ FTTF\ FTTF\ FFTT} (3), \mathbf{TTTT\ TTTT\ TTTT\ TTTT} (4), \\
 & \mathbf{FTFT\ FTFT\ FTFT\ FTTT} (1), \mathbf{FTTF\ FTTF\ FTTF\ FTTF} (1) \quad (1.0.2)
 \end{aligned}$$

Note: Eq. 1.0.2 as rendered serves as antecedent to the 1.n.2 consequents listed below.

$$1.10 \quad A r_\phi B = A r_\phi B. \quad (1.1.1)$$

$$\begin{aligned}
 & (((((r < u) \& (s < u)) > ((p = (w > v)) \& (t = (v > w)))) > (t = (x > ((y < u) > ((p \& y) = x)))) \\
 & > (z = (q \& (r \& s)))) > (z = z) ; \\
 & \mathbf{TTTT\ TTTT\ TTTT\ TTTT} (16) \quad (1.1.2)
 \end{aligned}$$

Remark 1.1.2: Eq. 1.1.1 is trivial with this result to be expected.

$$1.20 \quad A = \emptyset \Rightarrow A \cap_{\Phi} B = \{x \in B : \varphi(x) = \varphi(\emptyset)\}. \quad (1.2.1)$$

$$\begin{aligned} & (((((r < u) \& (s < u)) > ((p = (w > v)) \& (t = (v > w)))) > (t = (x > ((y < u) > ((p \& y) = x)))))) \\ & > (z = (q \& (r \& s))) > (((r = (z @ z)) > z) = ((x < s) > ((p \& x) = (p \& (z @ z))))); \end{aligned}$$

$$\mathbf{TFTF} \ \mathbf{TFTF} \ \mathbf{TTTT} \ \mathbf{TTTT} (8), \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} (8) \quad (1.2.2)$$

$$1.30 \quad A = B \Rightarrow A \cap_{\Phi} B = A. \quad (1.3.1)$$

$$\begin{aligned} & (((((r < u) \& (s < u)) > ((p = (w > v)) \& (t = (v > w)))) > (t = (x > ((y < u) > ((p \& y) = x)))))) \\ & > (z = (q \& (r \& s))) > ((r = s) > (z = r)); \end{aligned}$$

$$\begin{aligned} & \mathbf{TFTF} \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} (4), \ \mathbf{FTFT} \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} (4), \\ & \mathbf{FFFF} \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} (4), \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} (4) \end{aligned} \quad (1.3.2)$$

$$1.40 \quad A \cap B \Rightarrow A \cap_{\Phi} B. \quad (1.4.1)$$

$$\begin{aligned} & (((((r < u) \& (s < u)) > ((p = (w > v)) \& (t = (v > w)))) > (t = (x > ((y < u) > ((p \& y) = x)))))) \\ & > (z = (q \& (r \& s))) > ((r \& s) > z); \end{aligned}$$

$$\mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} (16) \quad (1.4.2)$$

Remark 1.4.2: Eq. 1.4.1 is trivial with this result to be expected.

$$1.50 \quad A \cap_{\Phi} B \neq A \cap B. \quad (1.5.1)$$

$$\begin{aligned} & (((((r < u) \& (s < u)) > ((p = (w > v)) \& (t = (v > w)))) > (t = (x > ((y < u) > ((p \& y) = x)))))) \\ & > (z = (q \& (r \& s))) > \sim (z > (r \& s)); \end{aligned}$$

$$\begin{aligned} & \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} (10), \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} (4), \\ & \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} (1), \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} (1) \end{aligned} \quad (1.5.2)$$

$$1.60 \quad (A \cap_{\Phi} B = A \cap B) \Leftrightarrow \varphi \text{ is an injective function.} \quad (1.6.1)$$

$$\begin{aligned} & (((((r < u) \& (s < u)) > ((p = (w > v)) \& (t = (v > w)))) > (t = (x > ((y < u) > ((p \& y) = x)))))) \\ & > (z = (q \& (r \& s))) > ((z = (r \& s)) = p); \end{aligned}$$

$$\begin{aligned} & \mathbf{TFTF} \ \mathbf{TFTF} \ \mathbf{TFTF} \ \mathbf{TFTF} (4), \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TFTF} (8), \\ & \mathbf{TFTF} \ \mathbf{TFTF} \ \mathbf{TFTF} \ \mathbf{FTFT} (4) \end{aligned} \quad (1.6.2)$$

$$1.70 \quad A \cap_{\Phi} B \subseteq A \cup B. \quad (1.7.1)$$

$$\begin{aligned} & (((((r < u) \& (s < u)) > ((p = (w > v)) \& (t = (v > w)))) > (t = (x > ((y < u) > ((p \& y) = x)))))) \\ & > (z = (q \& (r \& s))) > \sim ((r + s) < z); \end{aligned}$$

$$\begin{aligned} & \mathbf{TTTT} \ \mathbf{FFFF} \ \mathbf{FFFF} \ \mathbf{FFTT} (43), \ \mathbf{TTTT} \ \mathbf{FFFF} \ \mathbf{FFFF} \ \mathbf{FFFF} (16), \\ & \mathbf{TTTT} \ \mathbf{FFFF} \ \mathbf{FFFF} \ \mathbf{FFTF} (4), \ \mathbf{TTTT} \ \mathbf{FFFF} \ \mathbf{FFFF} \ \mathbf{FFFF} (1), \\ & \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} \ \mathbf{TTTT} (64) \end{aligned} \quad (1.7.2)$$

A set intersection operator was proposed for descriptively near sets and named descriptive union. In the Theorem 1 proof seven properties are listed: two are trivial tautologies; and five as rendered are *not* tautologous. The refutes descriptive intersection operators and near sets on which it is based.