Relational Typed Set Calculus

A set is a collection of distinct objects, a typed set classifies the membership of the set in meta-math.

Example

Three dimensional space is defined by a collection of points on three axis: x, y and z. In our definition of space x, y and z must be real numbers. In this theory the number of points in subsets of typed sets must be the same in order for them to be valid, as x y and z are treated independently but correlated.

Space is further defined by a second-order meta-description that defines the total dimensional distance, relative to the pole (0, 0, 0).

$$\widehat{space} := \begin{bmatrix} \langle\langle x\rangle : R^{+}, \langle y\rangle : R^{+}, \langle z\rangle : R^{+} \rangle \\ :: \\ \sqrt{x^2+y^2} + \sqrt{x^2+z^2} + \sqrt{y^2+z^2} \end{bmatrix} \triangleq \widehat{s}$$

$$\mu\,\widehat{s} = \langle\sqrt{x^2+y^2} + \sqrt{x^2+z^2} + \sqrt{y^2+z^2}\rangle$$

$$\partial^x\,\widehat{s} = \langle \sqrt{x^2+y^2} + \sqrt{x^2+z^2}\rangle$$

$$\partial^y\,\widehat{s} = \langle \sqrt{x^2+y^2} + \sqrt{y^2+z^2}\rangle$$

$$\partial^z\,\widehat{s} = \langle \sqrt{x^2+z^2} + \sqrt{y^2+z^2}\rangle$$

$$\overset{n}{\widehat{s}} \cap \overset{m}{\widehat{s}} = \langle \begin{matrix} \langle n_x \left| \partial^x \le\in \partial^x \overset{m}{\widehat{s}} \wedge\preccurlyeq\in m_x \wedge \mu \le \mu m \cup m_x \right| \partial^x \le\in \partial^x \overset{n}{\widehat{s}} \wedge\preccurlyeq\in n_x \wedge \mu \le \mu n\rangle, \\ \langle n_y \left| \partial^y \le\in \partial^y \overset{m}{\widehat{s}} \wedge\preccurlyeq\in m_y \wedge \mu \le \mu m \cup m_y \right| \partial^y \le\in \partial^y \overset{n}{\widehat{s}} \wedge\preccurlyeq\in n_y \wedge \mu \le \mu n\rangle, \\ \langle n_z \left| \partial^z \le\in \partial^z \overset{m}{\widehat{s}} \wedge\preccurlyeq\in m_z \wedge \mu \le \mu m \cup m_z \right| \partial^z \le\in \partial^z \overset{n}{\widehat{s}} \wedge\preccurlyeq\in n_z \wedge \mu \le \mu n\rangle \end{matrix} \rangle$$

$$\partial\partial^x\,\widehat{s} = \langle\,\langle x|\partial^x \succcurlyeq\in \partial^x(\widehat{s}-n) \wedge (\partial^y \succcurlyeq\in \partial^y(\widehat{s}-n) \vee \partial^z \succcurlyeq\in \partial^z(\widehat{s}-n))\rangle\rangle$$

$$\partial\partial^y\,\widehat{s} = \langle\,\langle y|\partial^y \succcurlyeq\in \partial^y(\widehat{s}-n) \wedge (\partial^x \succcurlyeq\in \partial^x(\widehat{s}-n) \vee \partial^z \succcurlyeq\in \partial^z(\widehat{s}-n))\rangle\rangle$$

$$\partial\partial^z\,\widehat{s} = \langle\,\langle z|\partial^z \succcurlyeq\in \partial^z(\widehat{s}-n) \wedge (\partial^x \succcurlyeq\in \partial^x(\widehat{s}-n) \vee \partial^y \succcurlyeq\in \partial^y(\widehat{s}-n))\rangle\rangle$$

$$\oint \widehat{s} = \langle\langle x| \in \partial\partial^x\rangle, \langle y| \in \partial\partial^y\rangle, \langle z| \in \partial\partial^z\rangle\,\rangle$$

$$Area\ of\ space \triangleq \dot{s} = \sum \mu \oint \widehat{s}$$

$$\widehat{thought} := \begin{bmatrix} \langle\langle utility_{real} \triangleq \mathrm{u}_r\rangle : R^{+}, \langle utility_{imaginary} \triangleq \mathrm{u}_i\rangle : R^{+}\rangle \\ :: \\ |(coeffecient_{real_n})(\mathrm{u}_r) + (coeffecient_{imaginary_n})(\mathrm{u}_i \triangleq (coeffecient_{marketplace_n})(\dot{\iota_{n_\infty}}))| \\ coeffecient_{real_n} + coeffecient_{imaginary_n} = 1 \end{bmatrix} \triangleq \widehat{i}$$