

A Legal Visualisation Tool Using Normative Diagrams

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Normative diagrams (or *Trivisonno-diagrams*) are based on the idea that a norm can be defined as a deontic modality – or rather a valuation – (i.e., *prohibition, permission, obligation*) ranging over a four-dimensional (*object, space, subject, time*) validity domain.

The **validity domain** U_ψ of a norm ψ can be represented as:

$$U_\psi = \{ \langle o_w, r_x, s_y, t_z \rangle \mid o_w \in [o_1, o_2] \wedge r_x \in [r_1, r_2] \wedge s_y \in [s_1, s_2] \wedge t_z \in [t_1, t_2] \}$$

Where the intervals $[x_1, x_2]$ correspond to the extension of the norm's validity domain in the respective dimension.

We present **ViNo (Visualisation of Norms)**, a tool that generates normative diagrams from given inputs. To use ViNo, one has to define the following:

A **NormSystem** with

- a scale for each of the four dimensions giving the possible values in that dimension
- a scale for a possible hierarchy differentiation between norms

The possibly relevant **Norm(s)** with

- a start and end value for each dimension's scale for the validity of the norm on that scale
- a hierarchy value from the hierarchy scale
- an indicator for when the norm was introduced
- a valuation type
- an (optional) identifier

The **Case(s)** of interest with

- a concrete value for each of the four dimension's scales
- an (optional) identifier

Example

Processing data of non-EU citizens with consent as regulated by the GDPR.

The Case is subsumed under the Norm

NormSystem

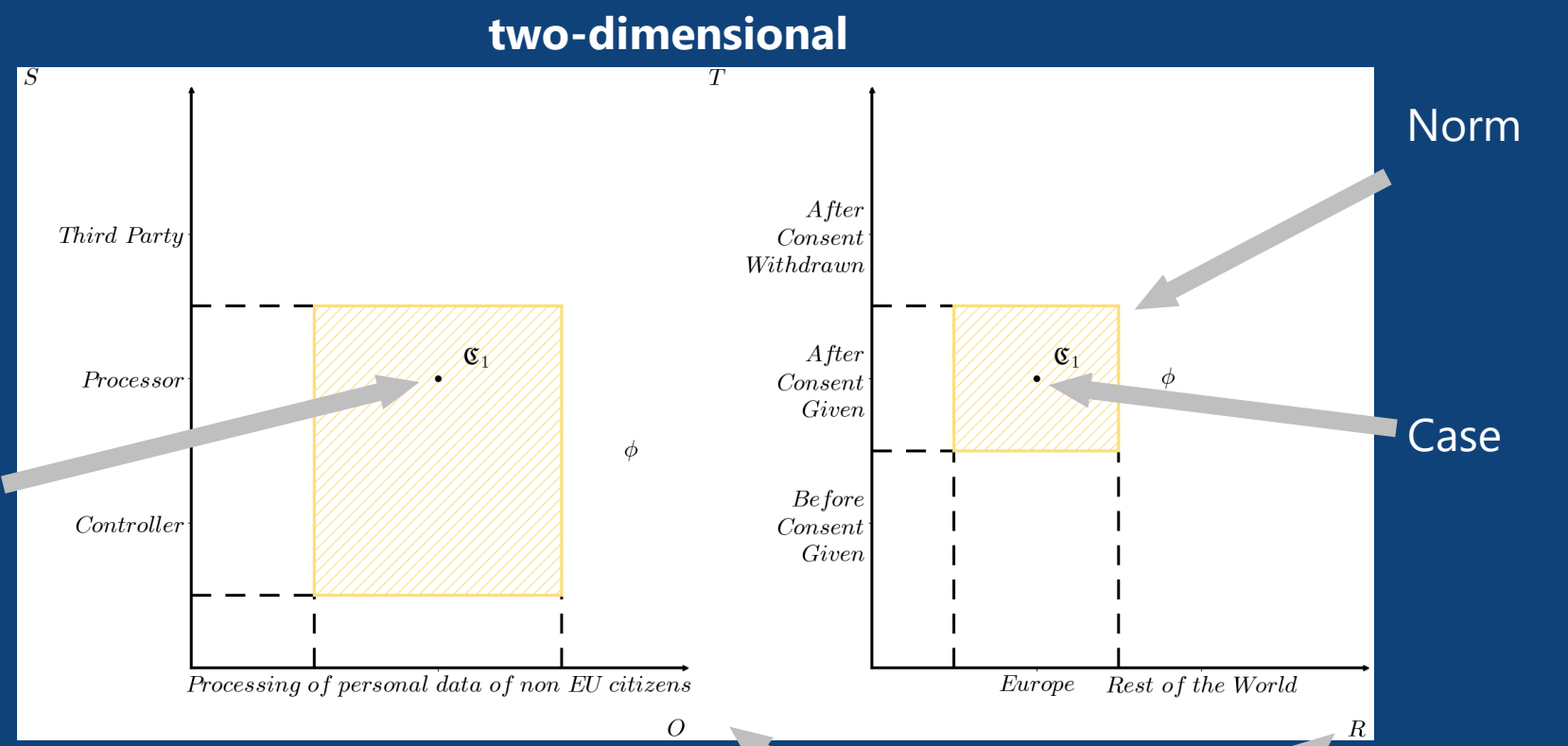
o_scale = [Processing of personal data of non-EU citizens]
 r_scale = [Europe, Rest of the World]
 s_scale = [Controller, Processor, Third Party]
 t_scale = [Before Consent Given, After Consent Given, After Consent Withdrawn]
 h_scale = [H₁, H₂, H₃]

Norm

o_values = (Processing of personal data of non-EU citizens, Processing of personal data of non-EU citizens)
 r_values = (Europe, Europe)
 s_values = (Controller, Processor)
 t_values = (After Consent Given, After Consent Given)
 h_value = H₂
 introduced = 16
 type = Permission
 identifier = ψ

Case

o_value = Processing of personal data of non-EU citizens
 r_value = Europe
 s_value = Processor
 t_value = After Consent Given
 identifier = ϕ_1



The axes can be chosen at will



The Case is subsumed under the Norm

Hierarchy

Indicator for when the Norm was introduced

Legal Antinomies

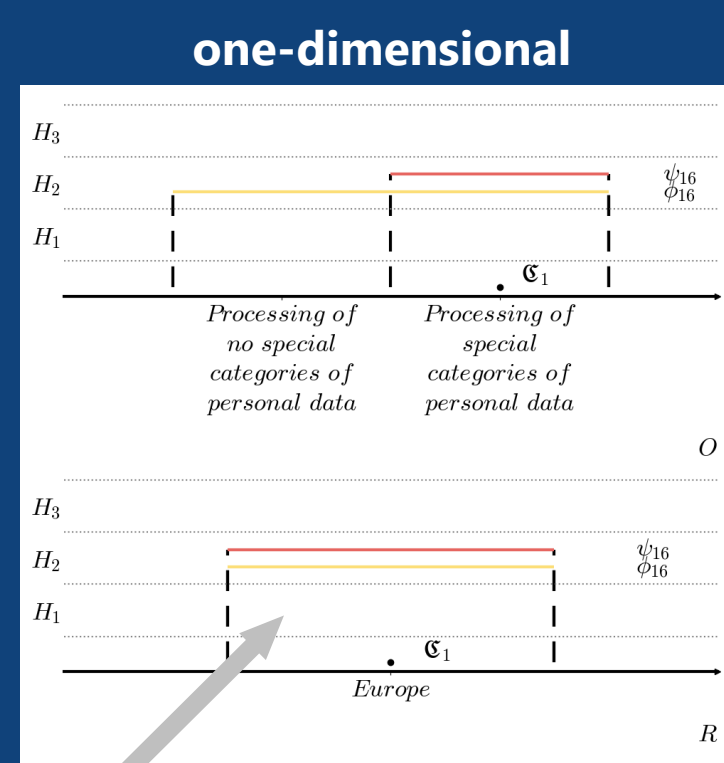
More than one Norm applies to a Case, but their deontic values are differing.

The **colors** of the Norms depend on their valuation type:

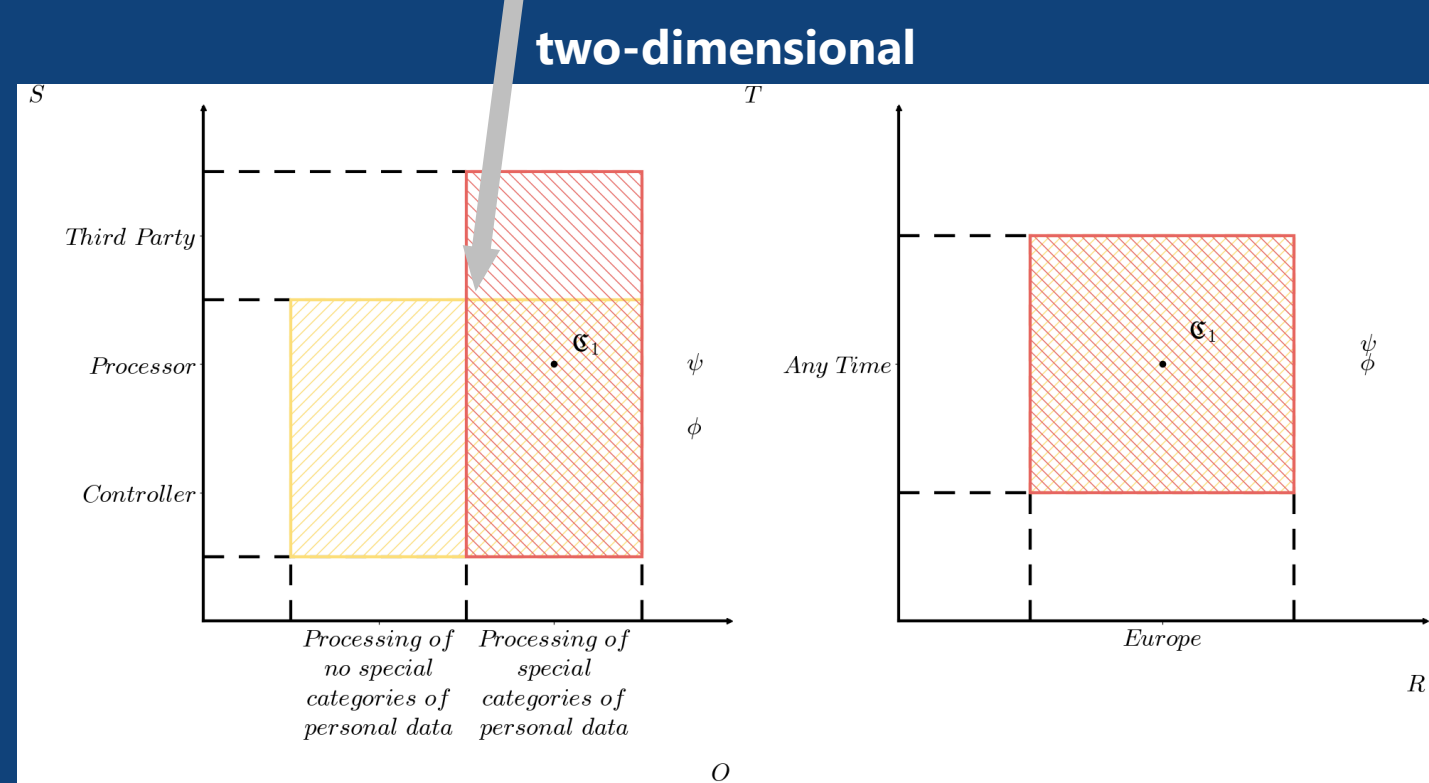
Red for prohibitions
Yellow for permissions
Blue for obligations

The colors can be adjusted to e.g., mitigate color blindness.

Antinomies are displayed as **overlapping norms**.



Antinomy



Analogy and Appeal to the Contrary

Cases that cannot be subsumed under an applicable norm

A **dashed extension** of the Norm displays a possible **Analogy**.

A **dashed arrow** indicates a possible **Appeal to the Contrary**. Here, prohibitions and permissions are considered contrary to each other and the dashed arrows take on the color of the contrary class.

