

Advanced visualization with VisNow platform

Time dependent data



VISNOW



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UNIVERSITY OF WARSAW
Interdisciplinary Centre for Mathematical
and Computational Modelling
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Data for visualization

Geometry

- N-dimensional point coordinates (N=1,2,3)
 - Location in space
 - Naturally given or calculated on the basis of structure or values
 - Explicit or easily calculable

Structure

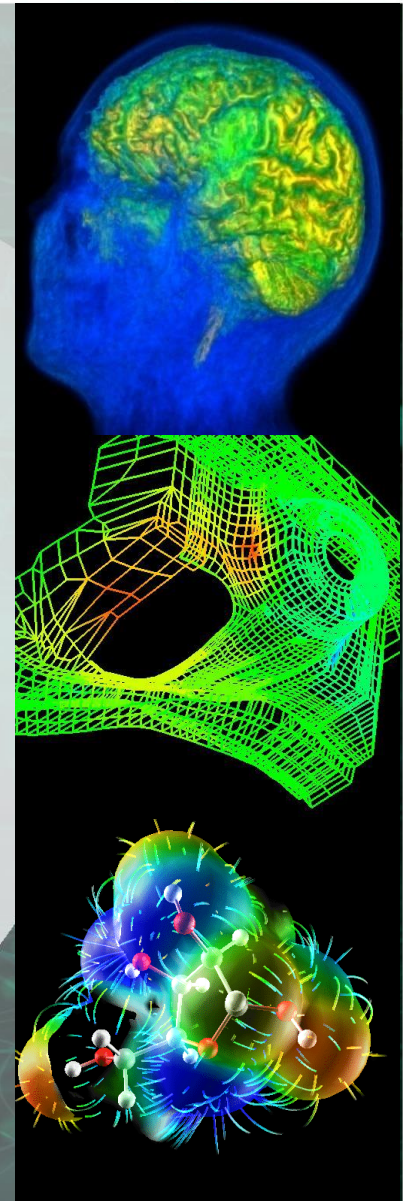
- Logical relations between points
- Usually imposes possible interpolations
- Problem dependant

Values

- Scalar, vector, tensor, symbolic, etc.

Generic data type

- **FIELD = geometry + structure + values**



Time dependency in VisNow fields

Limitations

- Structure is constant
- Space dimensionality is constant
- Components structure is constant (not the data itself)
- Regular field
 - Field dimensionality
 - Space dimensionality
 - Grid size
 - Affine geometry
 - Node data components structure
- Irregular field
 - Number of nodes
 - Space dimensionality
 - Cells and cellsets
 - Node data components structure
 - Cell data components structure

Time dependency in VisNow fields

Time dependency

- One or more of:
 - **Geometry (explicit)**
 - **Mask**
 - **Component data**
- Time dependency is based on time points
- Each entry (coordinates, mask or component data) is a pair:
time point + actual data
- Time points are independent
- Geometry and mask time dependency can be combined to
mimick structural changes

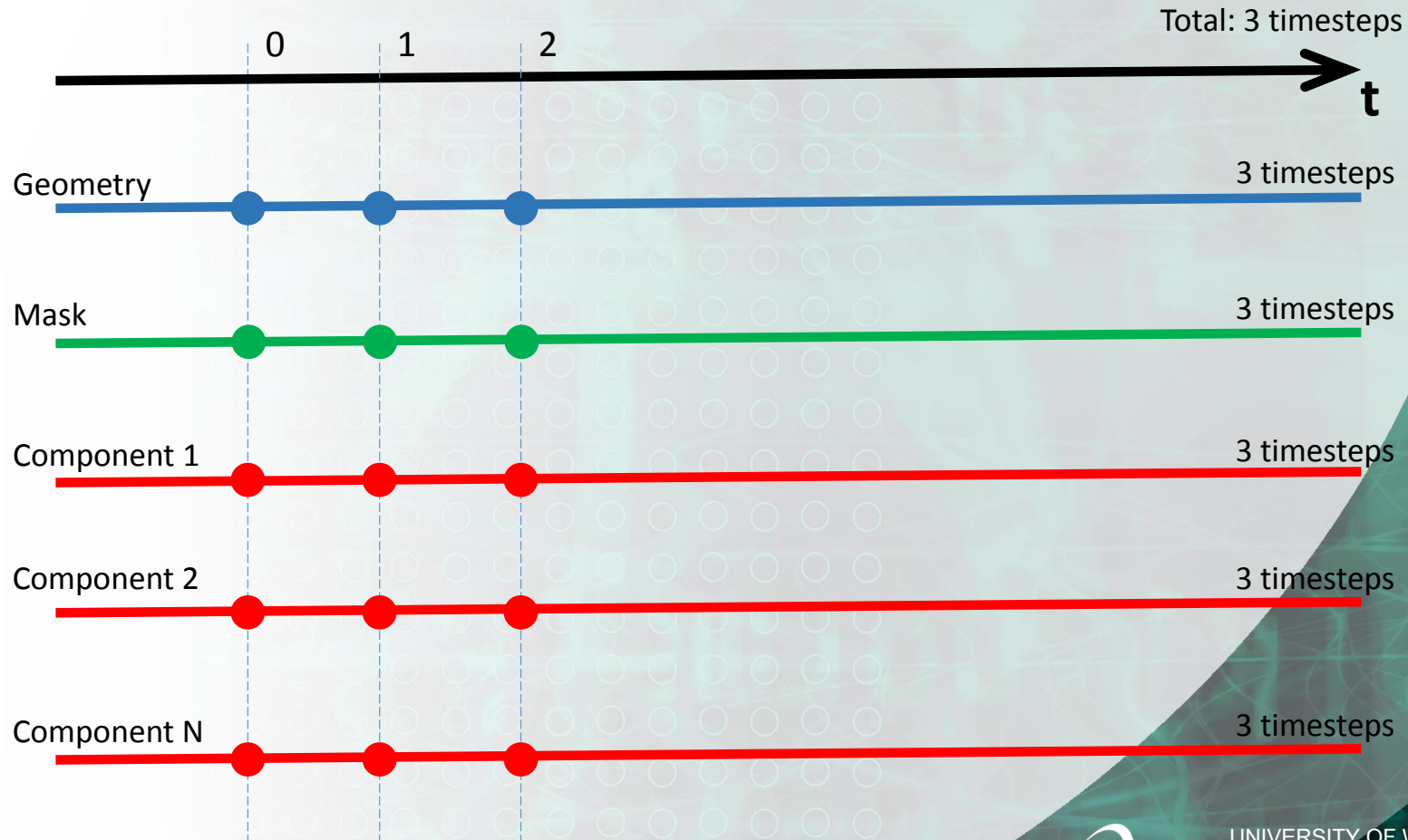
Time dependency in VisNow fields

Static field



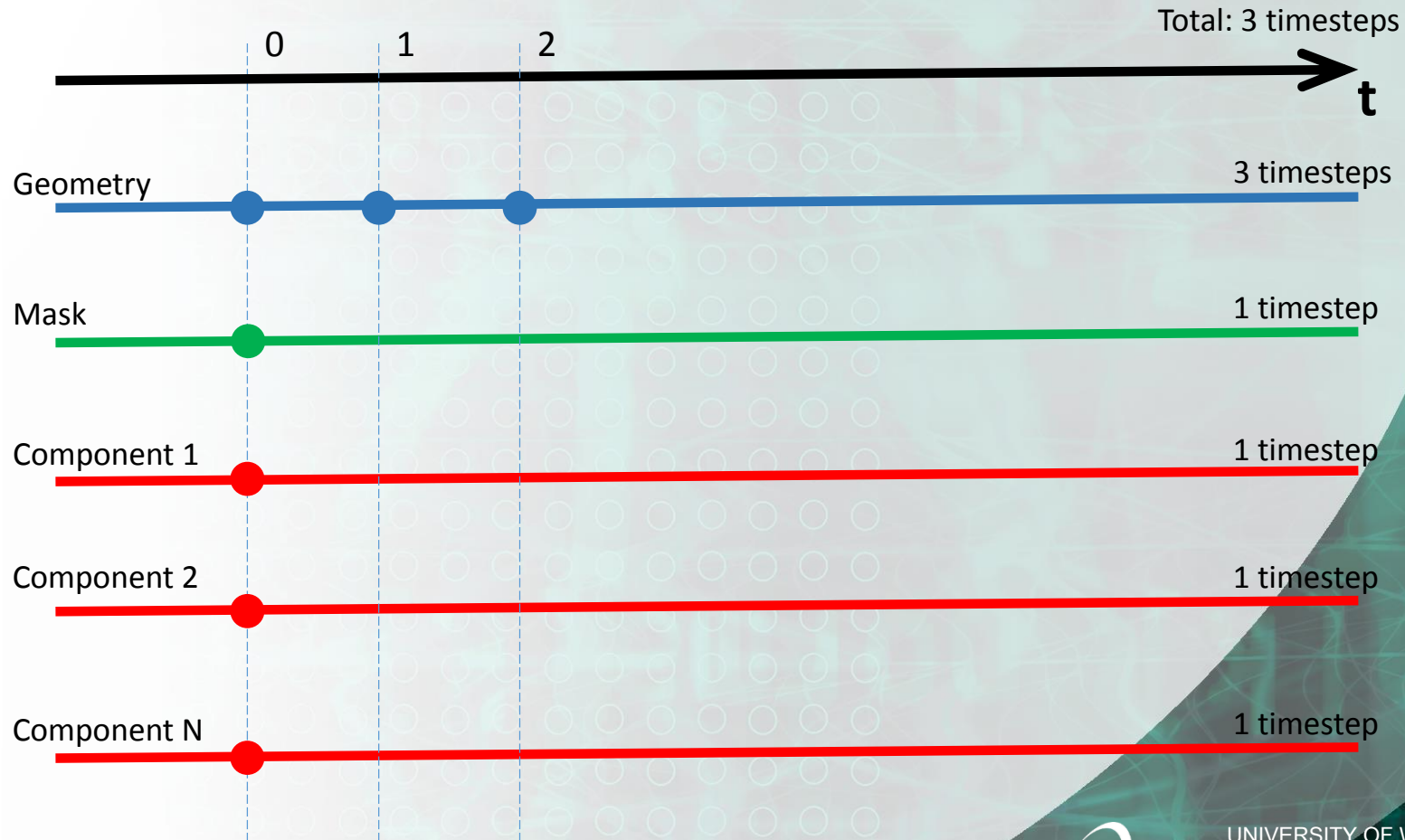
Time dependency in VisNow fields

Time dependency – full



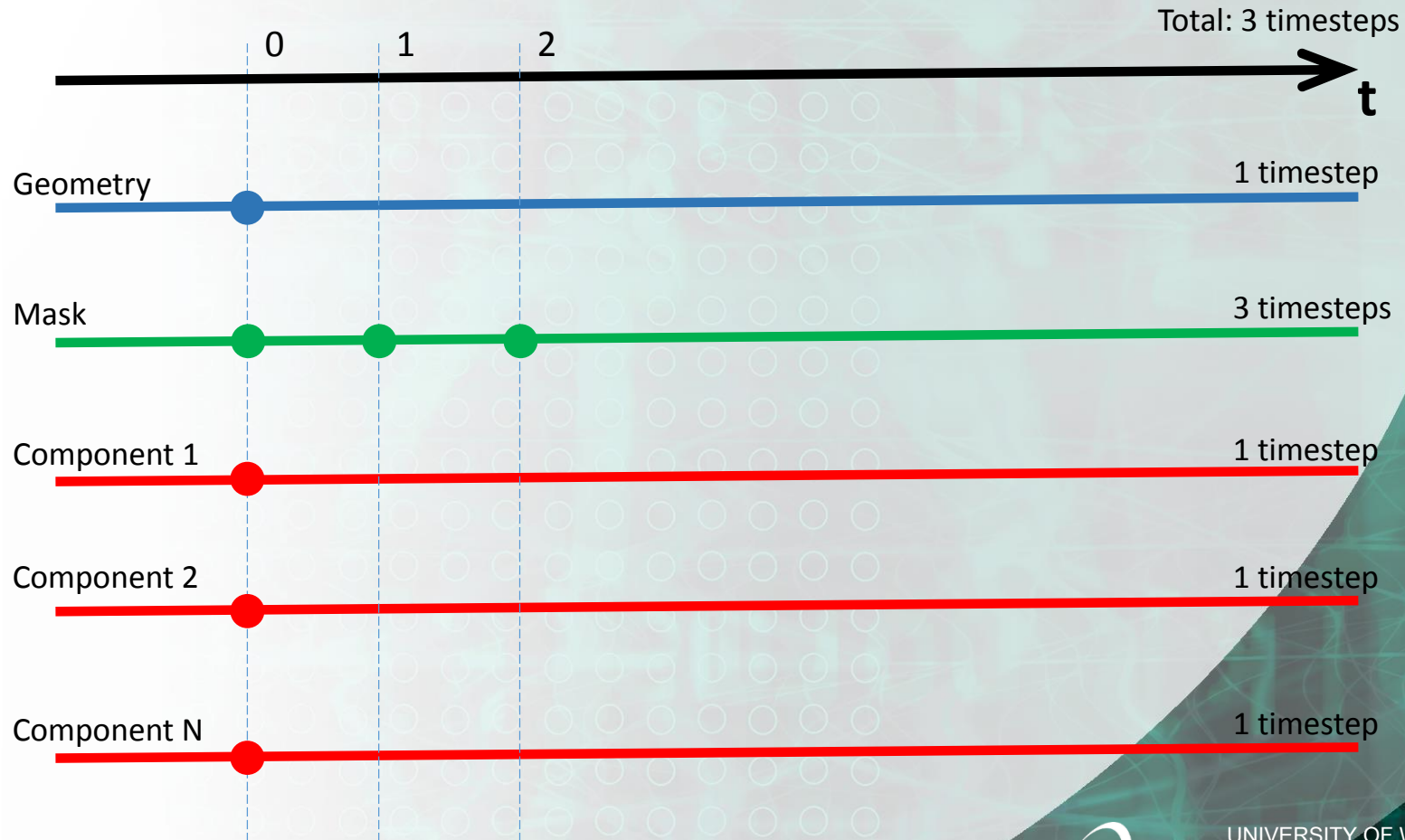
Time dependency in VisNow fields

Time dependency – geometry only



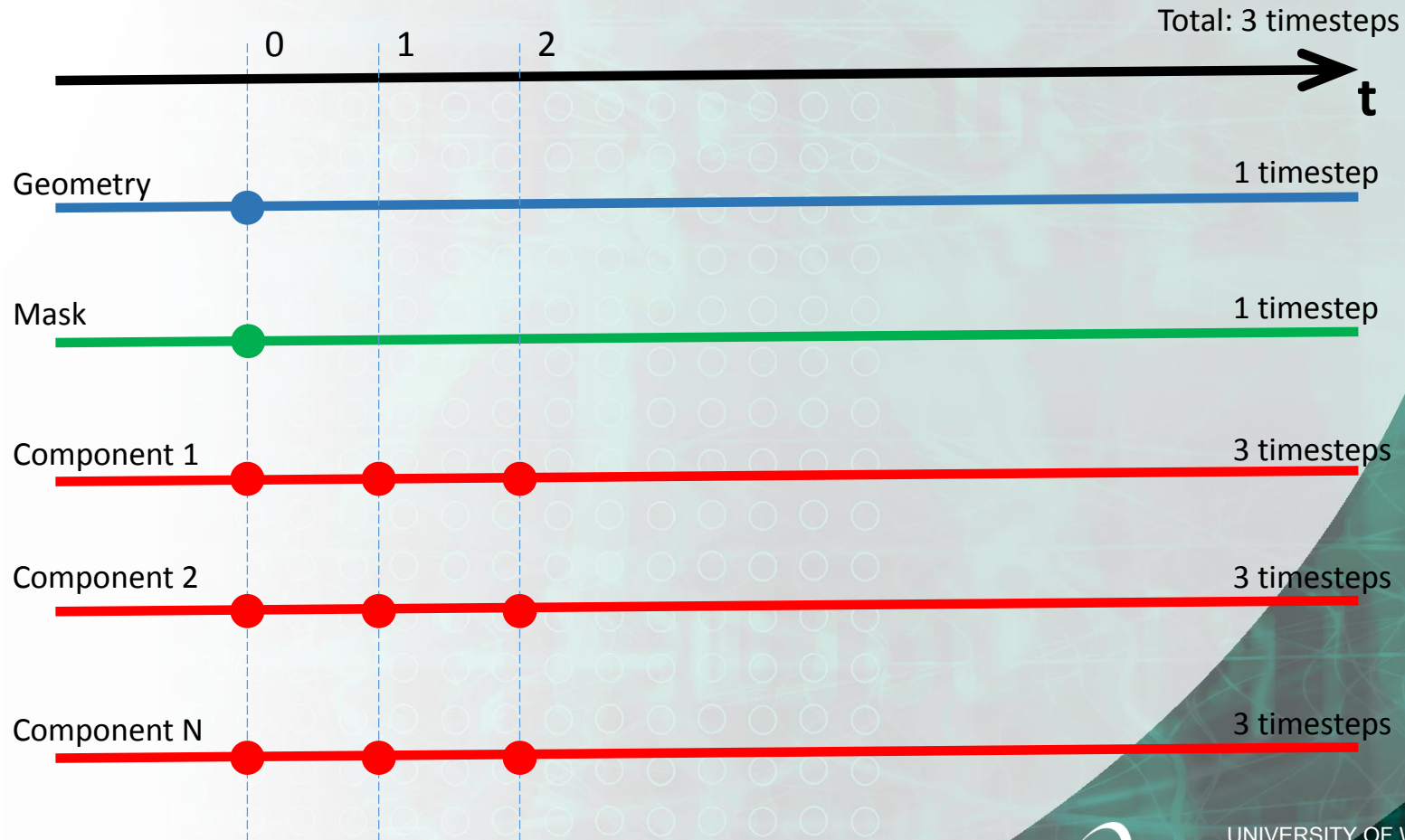
Time dependency in VisNow fields

Time dependency – mask only



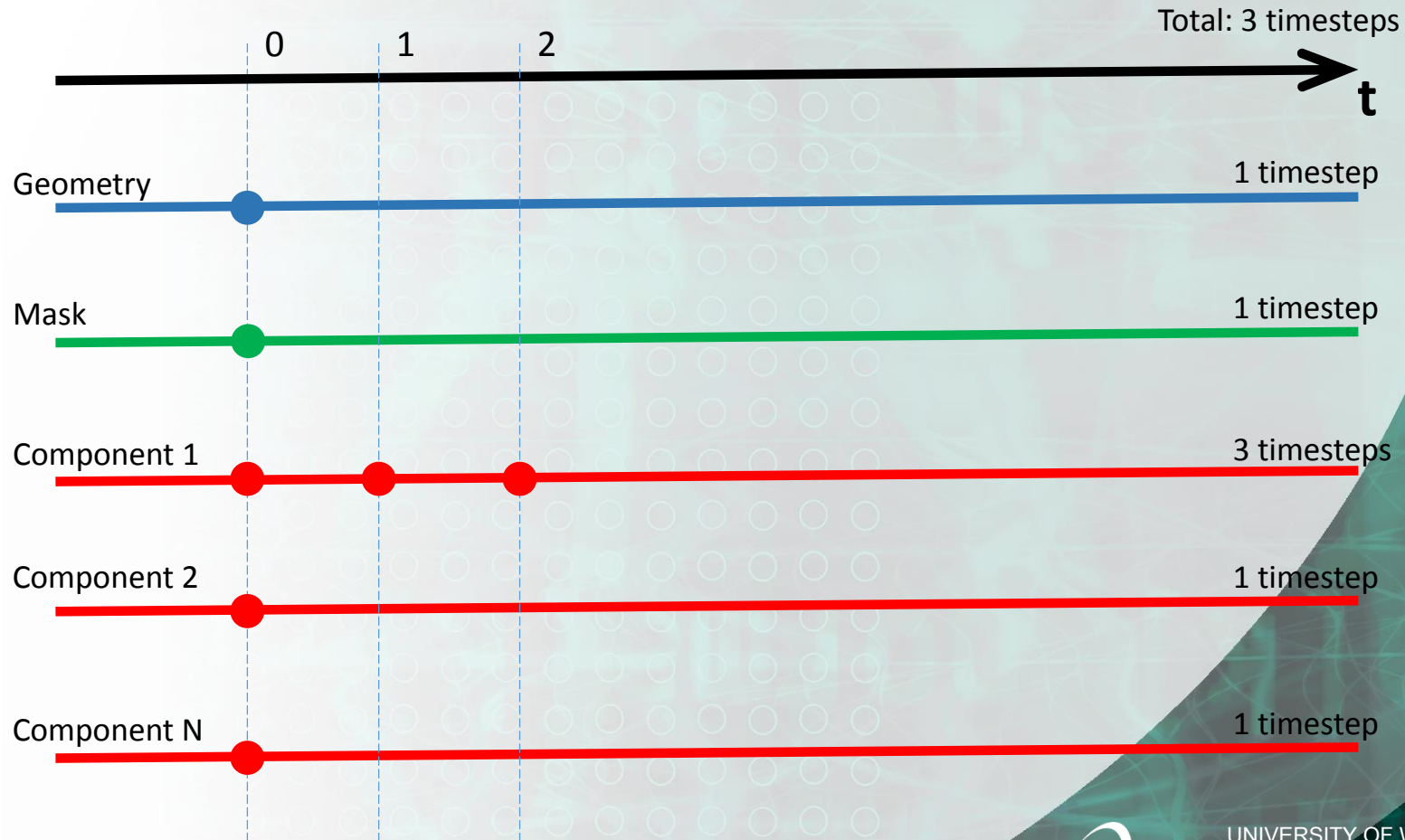
Time dependency in VisNow fields

Time dependency – components only



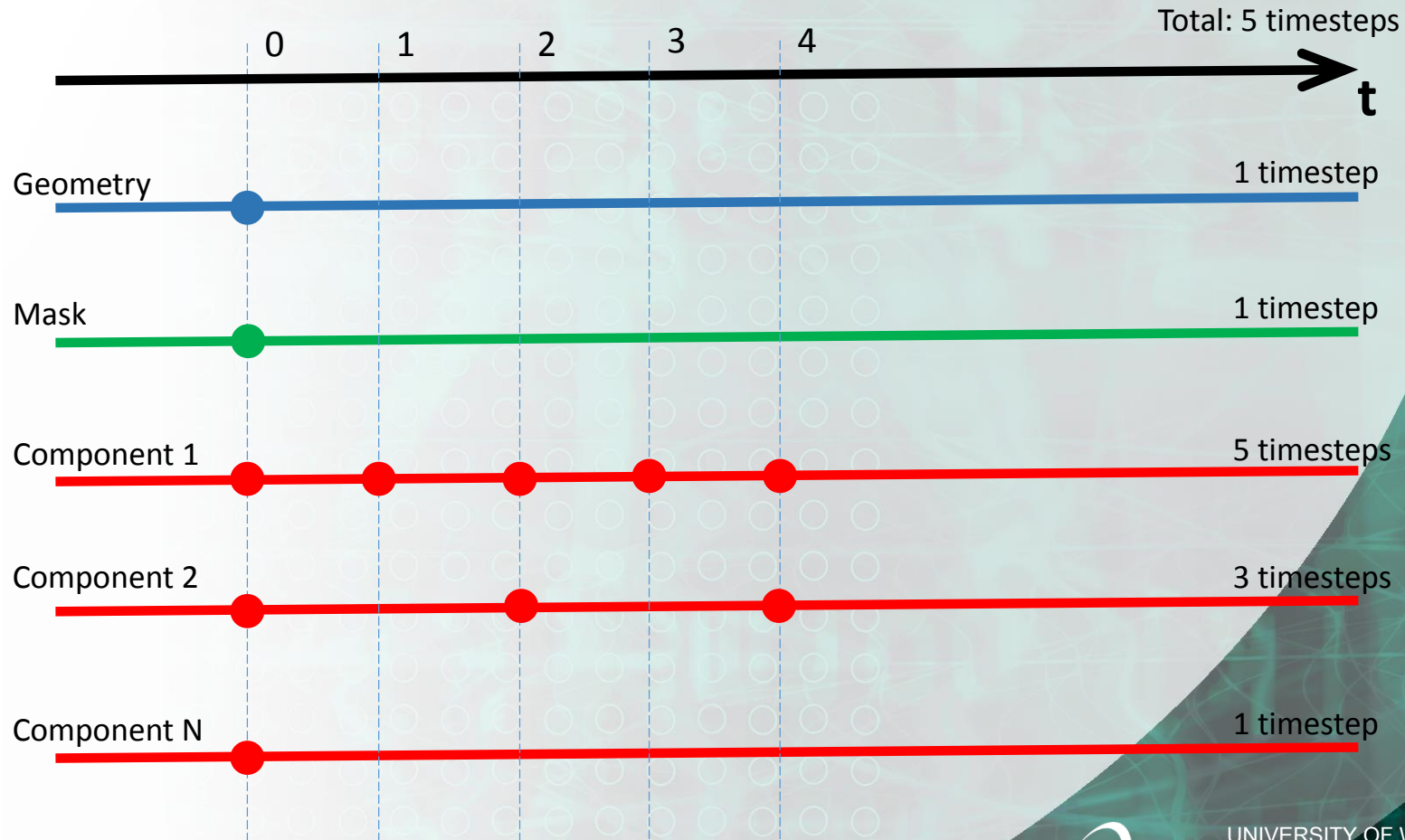
Time dependency in VisNow fields

Time dependency – component only



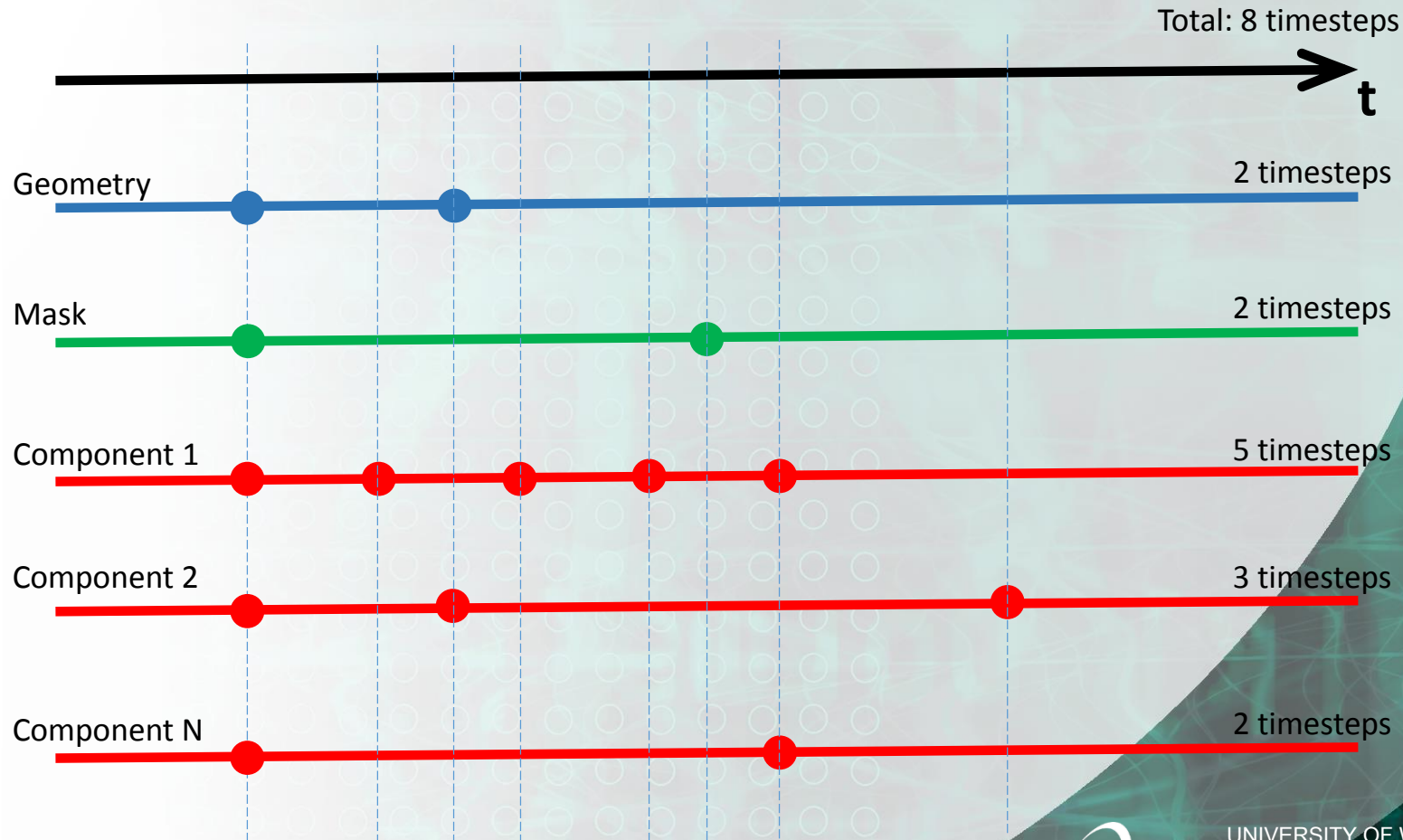
Time dependency in VisNow fields

Time dependency – different time steps



Time dependency in VisNow fields

Time dependency – freestyle



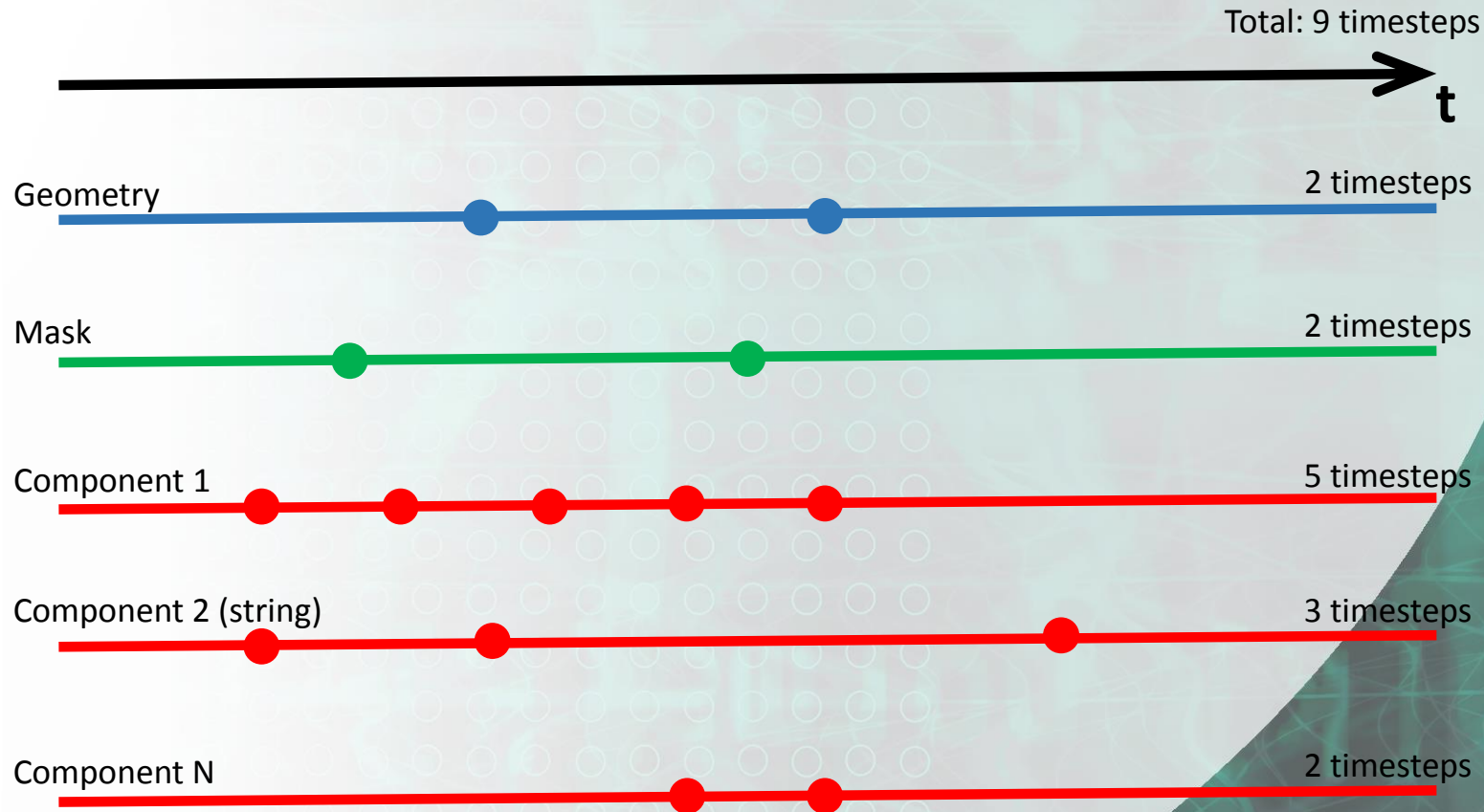
Time dependency in VisNow fields

Time dependency

- What if there's no entry at a given time? E.g. 2.5
- Interpolation!
- Outside entries – nearest neighbour
- Between entries:
 - Geometry – linear
 - Mask – nearest neighbour
 - Numeric components (byte, short, int, float, double) – linear
 - Non-numeric components (string, logic, object) – nearest neighbour

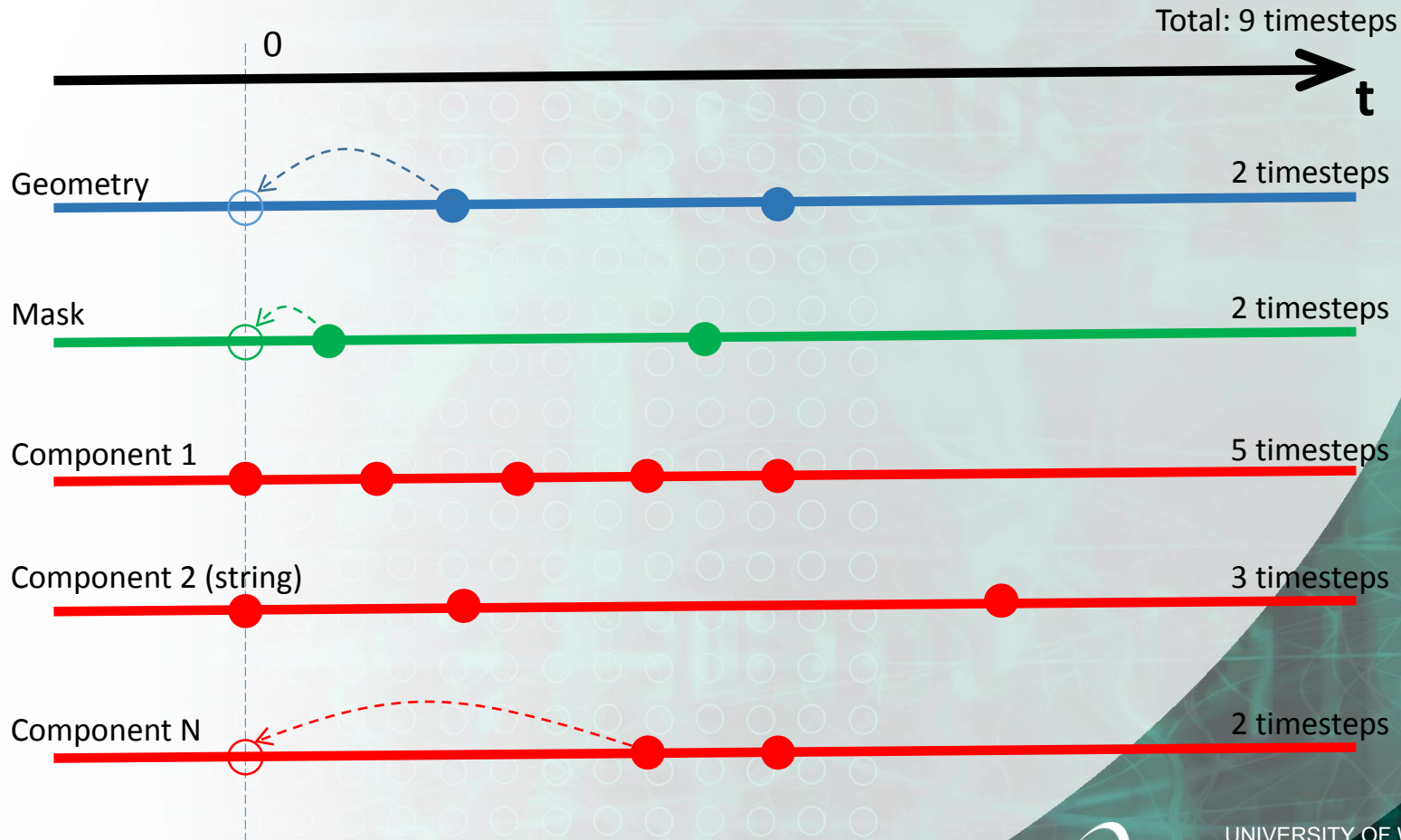
Time dependency in VisNow fields

Time dependency – interpolated freestyle



Time dependency in VisNow fields

Time dependency – interpolated freestyle

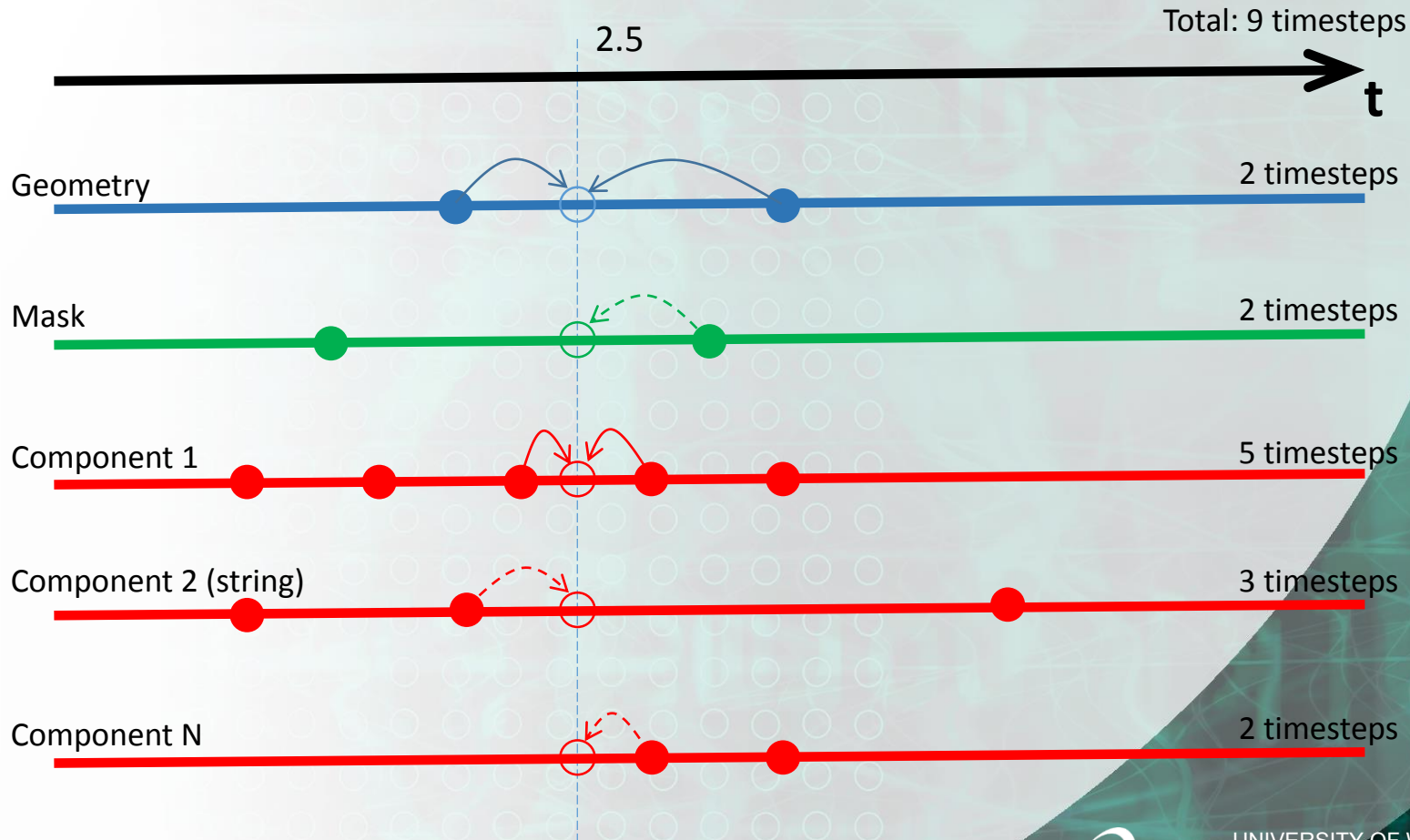


----- Nearest neighbour interpolation
————— Linear interpolation



Time dependency in VisNow fields

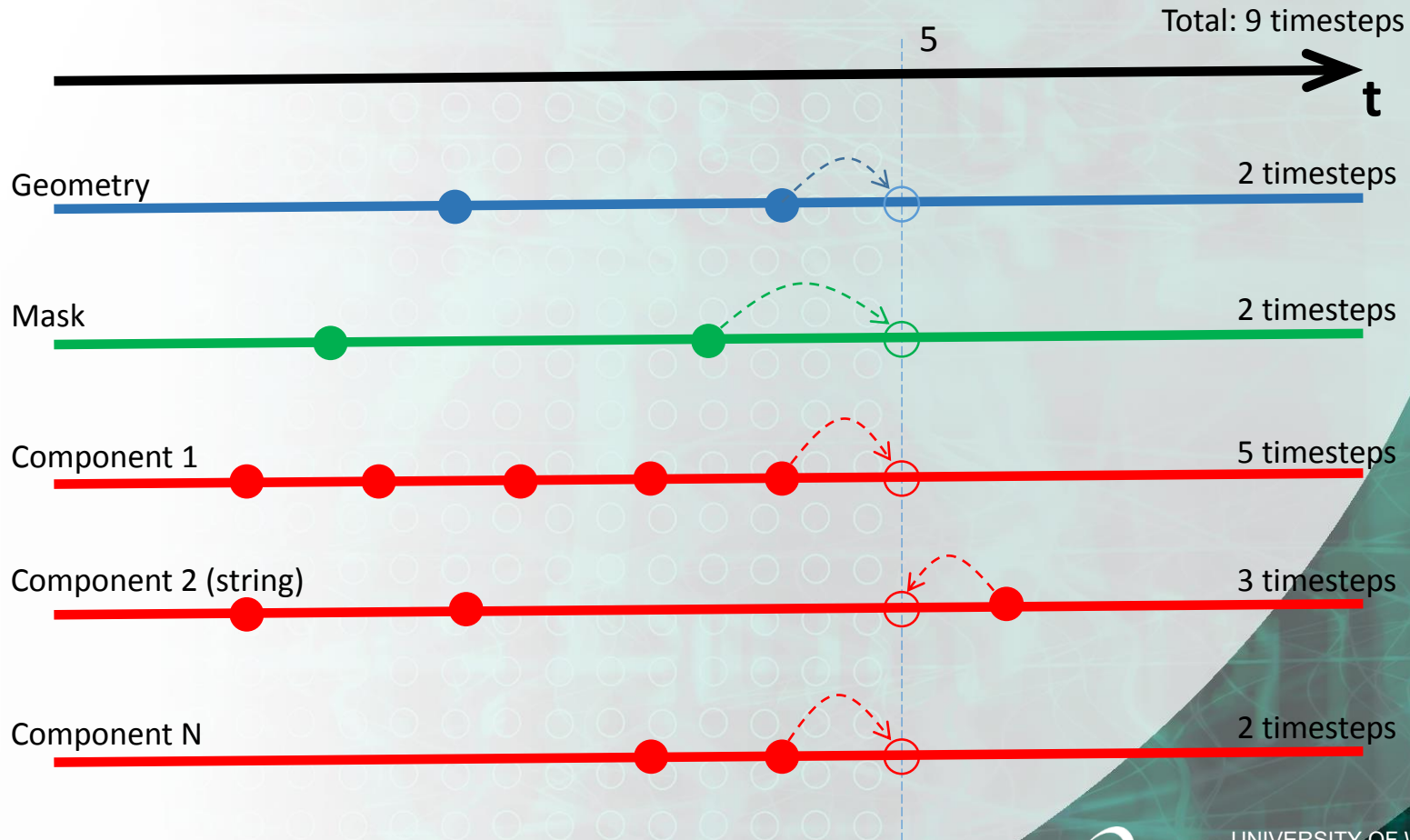
Time dependency – interpolated freestyle



----- Nearest neighbour interpolation
———— Linear interpolation

Time dependency in VisNow fields

Time dependency – interpolated freestyle



----- Nearest neighbour interpolation
———— Linear interpolation



VISNOW

visnow.icm.edu.pl

Contact:

visnow@icm.edu.pl

Interdisciplinary Centre for Mathematical and Computational Modelling

University of Warsaw

Bartosz Borucki, Krzysztof Nowiński



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