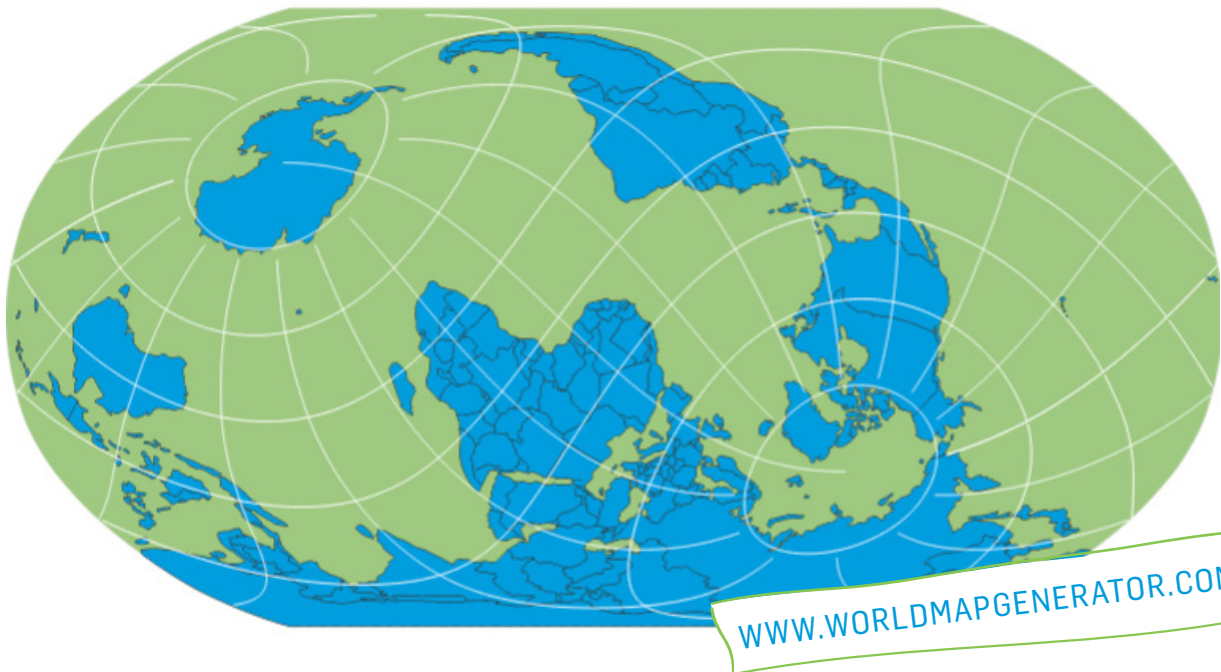


# «Viewpoints»

## *The World in Perspective*



### *Summary:*

The «Viewpoints» project explores the aesthetic question whether there is a parameter-based method for generating unconventional maps of the world that do justice to the thematic context in which they appear. A project-specific software is developed that combines parameters of descriptive geometry and map graphics in an explorative process to bring forth the desired effects in world maps. So far, map production by means of projection has been governed by certain rules that determine the geographical area depicted at the centre of the map. With conventional world maps, the horizontal centre is usually made up by the equator.

The project software enables the generation and design of wholly new and unconventional varieties of world maps in simple and structured ways.

Unconventional world maps – varying perspectives, alternative angles – shifts in point of view – viewpoints.

### *Key terms:*

Graphic design, mathematical cartography, world maps, generative graphics, critical cartography

### *Funding:*

Berne, University of Applied Sciences (BFH) |  
Berne University of the Arts (HKB) [www.hkb.bfh.ch/en/research/forschungsschwerpunkte/](http://www.hkb.bfh.ch/en/research/forschungsschwerpunkte/)

### *Duration:*

January 2012 – November 2013

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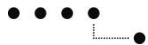
Manuela Pfrunder

#### *Software:*

Fabrice Tereszkiwicz, (Philipp Läubli)

#### *Academic supervisors:*

Harald Klingemann | Thomas Dittelbach



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Area 2: Communication through world maps ..... S. 11 – 12

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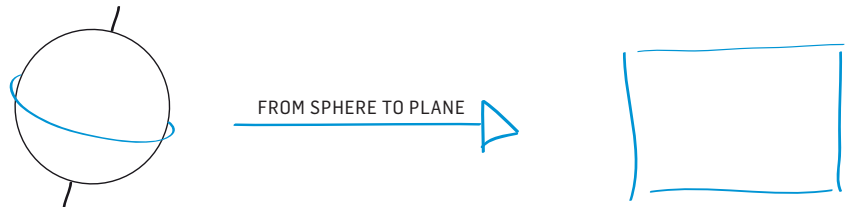
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## INTRODUCTION: CONSTRUCTING WORLD MAPS

### PROJECTION

A projection provides the mathematical basis for mapping the three-dimensional globe onto a two-dimensional plane. Any of a variety of projections may be chosen for the process.



### GREAT CIRCLES

The equator and the meridians constitute orthogonal great circles of the globe. «Oblique» great circles intersect the equator at an angle, but as with the equator, their plane passes through the centre of the globe.

The maps of «Viewpoints» replace the equatorial great circle with any other great circle of choice as their horizontal centre. Thus any geographical area whatsoever can be put at the centre of the pictorial representation.

#### COMMON PROJECTIONS – A SELECTION



*Robinson*



*Canters  
Pseudocylindric*



*Eckert III*



*Sinusoidal*

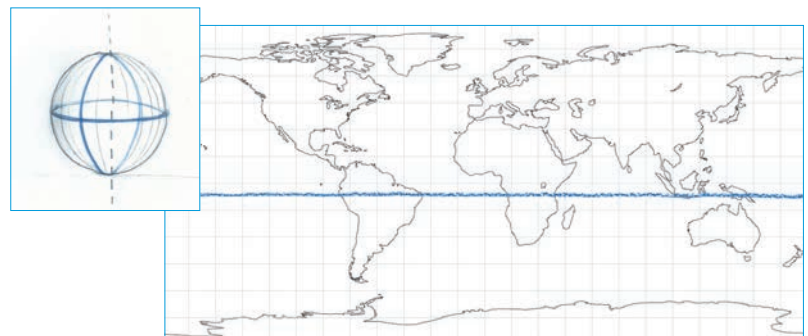


*Plate carrée*

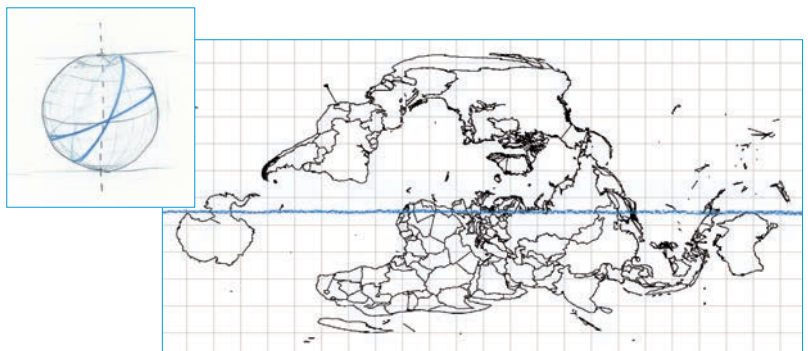
### CONVENTIONAL MAPPING, UNCONVENTIONAL MAPS

The world maps generated in «Viewpoints» vary only the geographical area at their centre; however, the mathematical mapping – projection rules and algorithms – remains the same as with conventional maps.

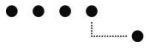
While there do exist maps that feature centres other than the equator, common projections tend to come with predefined centres that are not supposed to be freely modified.



*Equirectangular projection with equator as equidistant centre  
(Plate carrée)*

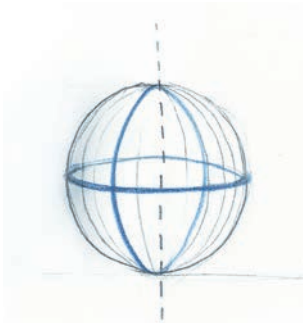


*Equirectangular projection with «oblique» great circle as equidistant centre*

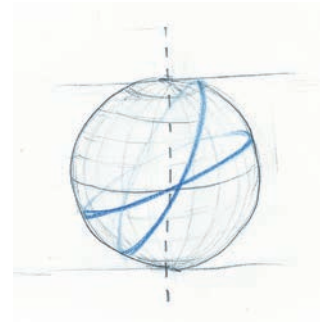
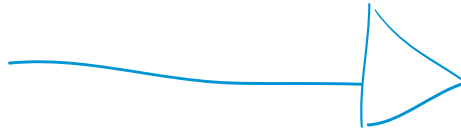


## FROM CONVENTIONAL...

## TO UNCONVENTIONAL WORLD MAPS



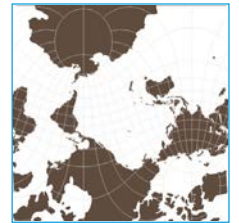
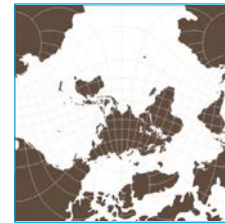
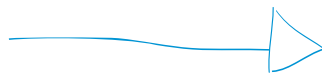
*Equator and meridians as  
orthogonal great circles*



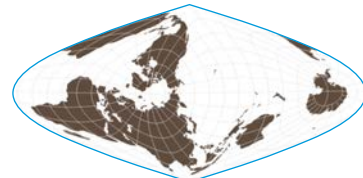
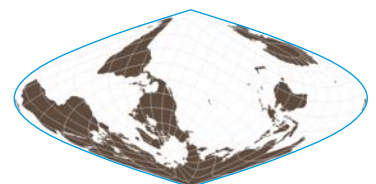
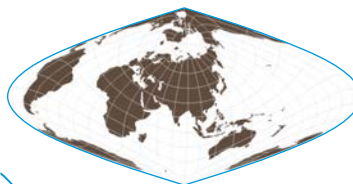
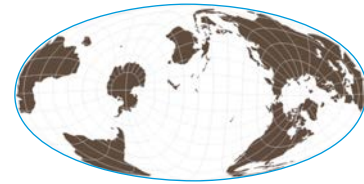
*Equator and meridians as  
«oblique» great circles*



*Merkatorprojektion*



*Mollweideprojektion*



## WORLD MAP DESIGN

### COLOURS, PATTERNS, LINES

Conventional world maps adhere to certain norms also with regard to surface design. Water, for instance, is usually rendered in blue, land masses in tones of brown, etc. Common software for world map design tends to be built around technical aspects, with design options largely focussing on representation of topography.

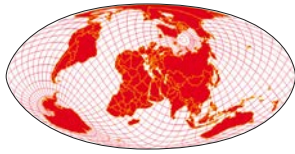
The software developed by «Viewpoints» offers a wide range of tools that open up new possibilities for surface design. Besides colour, various patterns and line weights can be selected to represent a multitude of geographical features. Land and water masses, national borders and individual countries can be edited. Grid lines can be varied in density or suppressed.

The menu for rendering geographical features in «Da Vinci».  
(January 2013)

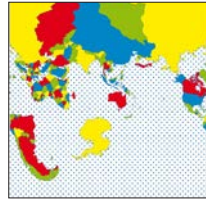
The «Da Vinci» desktop of the «Viewpoints» software: surface design (January 2013)



SURFACE DESIGN EXAMPLES



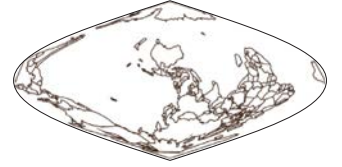
*water mass, national borders and Grid*



*countries and water mass*



*water mass*



*land mass*



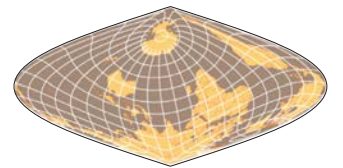
*land mass and water mass*



*water mass, national borders and Grid*



*land mass*



*water masses, land mass, Grid and national borders*



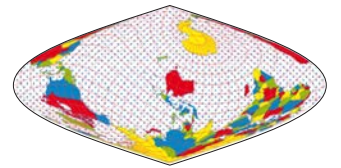
*water mass, land mass and Grid*



*countries*



*land mass and water mass*



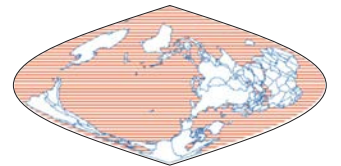
*countries, water mass and Grid*



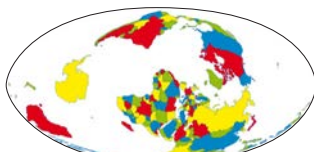
*water mass and national borders*



*national borders*



*water mass und national borders*



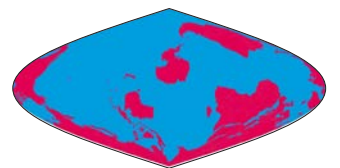
*countries*



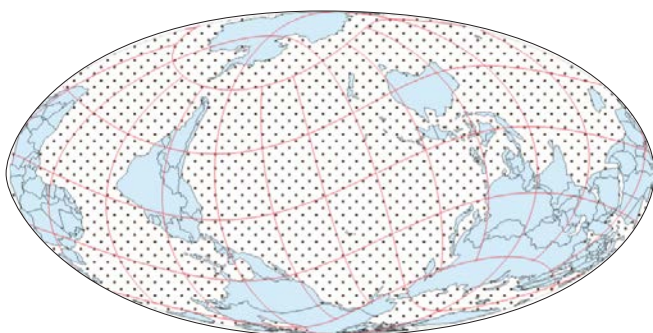
*water mass, land mass and Grid*



*countries, water mass and Grid*



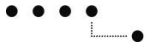
*water mass and land mass*



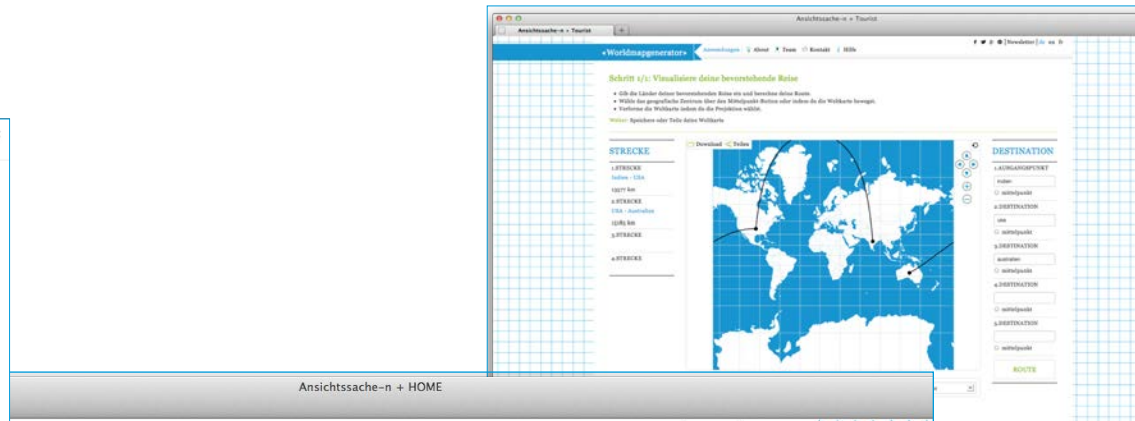
*land mass, water mass, Grid and national borders*



*land mass, water masses, Grid and national borders*



## THE SOFTWARE



### Generiere deine Weltkarte ...

Stellst du dir vor, dass der Norden auf einer Weltkarte "oben" dargestellt ist? Weisst du, ob Grönland wirklich grösser als Australien ist? Liegt die westliche Zivilisation tatsächlich im Westen? Wie stellt man eigentlich die Schiffsroute von Asien über die Arktis nach Europa dar? Hast du schon einmal eine Weltkarte gestaltet? Klicke auf "Da Vinci", "Journalist" oder "Tourist" und generiere deine eigene Weltkarte.

**Da Vinci**

*Spüre die Entstehung der Perspektive auf*

Gestaltung und Konstruktion **von** Weltkarten

**Journalist**

*Setze Weltkarten in den Nachrichtenkontext*

Kommunikation **über** Weltkarten

**Tourist**

*Visualisiere deine bevorstehende Reise*

Verortung **in** Weltkarten

### Interessiert? Erhalte den Weltkarten-Newsletter ...

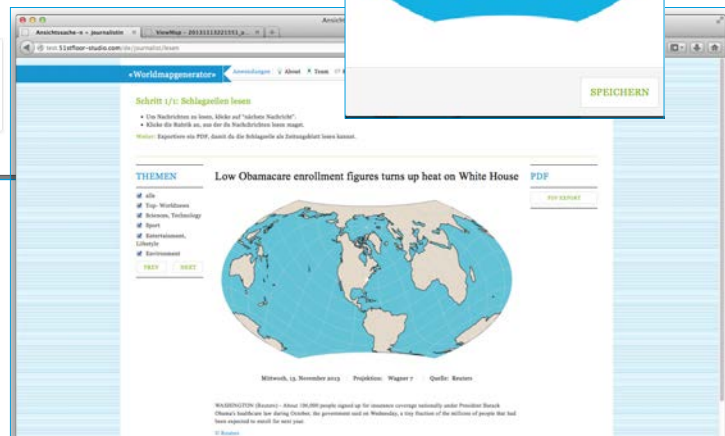
Melde dich für den Newsletter an, trage deine E-mail Adresse hier ein.

SUBMIT



### Kosmonaut

Der Blick aus einer Fremdperspektive.



### Social Networks



### Email

Ihre E-mail Adresse \*

An \*

Betreff \*

VERSENDEN



## THREE «PROTAGONISTS» IN THREE THEMATIC AREAS

The «Viewpoints» software is conceived such that its unconventional world maps may serve a broad range of concrete applications. This is achieved by a structure of three overarching thematic areas, each featuring one design «protagonists». Each area comes with its own specific applications, software functions, target audiences and envisaged benefits. The total of three «protagonists» in their turn assume different roles within their area.

«Worldmappgenerator» Anwendungen | About | Team | Kontakt | Hilfe

Generiere deine Weltkarte ...

Stellst du dir vor, dass der Norden auf einer Weltkarte "oben" dargestellt ist? Weisst du, ob Grönland wirklich grösser als Australien ist? Liegt die "westliche Zivilisation" tatsächlich im Westen? Wie stellt man eigentlich die Schiffsroute von Asien über die Arktis nach Europa dar? Hast du schon einmal eine Weltkarte gestaltet? Klicke auf "Da Vinci", "Journalist" oder "Tourist" und generiere deine eigene Weltkarte.

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Gestaltung und Konstruktion von Weltkarten

**Journalist**  
Setze Weltkarten in den Nachrichtenkontext  
Kommunikation über Weltkarten

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Visualisiere deine bevorstehende Reise  
Verortung in Weltkarten

Interessiert? Erhalte den Weltkarten-Newsletter ...

Melde dich für den Newsletter an, trage deine E-mail Adresse hier ein.

Konzepte zu weiteren Anwendungen:

**Schüler**  
Auf der Spur der Konstruktion in unkonventionellen Weltkarten.

**Kartograf**  
Auf der Suche nach den wahren Länderformen.

**Kosmonaut**  
Der Blick aus einer Fremdperspektive.

Interface of the «Worldmappgenerator» Software. Three Protagonist in three thematic areas.



## CONSTRUCTION & DESIGN *of* WORLDMAPS

*This area is centred on descriptive geometry and world map design. «DA VINCI» is implemented in the current software version. The «STUDENT» and the «CARTOGRAPHER» are elaborated as a concept.*

*Map design here is highly flexible in that a wide range of parameters are available. This freedom puts aspects of construction and design in the foreground. Users are free to indulge in trying out many cartographical features and to familiarize themselves with the aesthetics of world maps in an intuitive manner.*

### USERS & TARGET AUDIENCE

In this area, the user is acquainted with descriptive geometry and world map design through an explorative process of «learning by doing». By free experimentation with software functions, an understanding of these fields is gradually developed.

The area is firstly intended to serve educational institutions, particularly at advanced levels. Apart from the learning process involved in creating one's own world maps, maps may also be custom-made for any further purposes at hand.

Another target audience of area 1 are graphic designers, who are offered a simple way of generating basic materials for designing world maps.

### THEORETICAL BACKGROUND

Mapping a three-dimensional object onto a two-dimensional plane entails distortion. Cartography starts from a sphere – namely, Earth – which it aims to represent on a two-dimensional plane – the map. While spatial representation in two-dimensions is governed by the laws of perspective, mathematical cartography resorts to projections in making the transition from sphere to map. The outcome of this transition depends on various factors, which are made explicit in area 1 both abstractly and concretely in relation to the actual mapping of the Earth. The focus here is always on descriptive geometry, i.e. the shaping of surfaces.



## DA VINCI: *Construction and Design of Worldmaps*

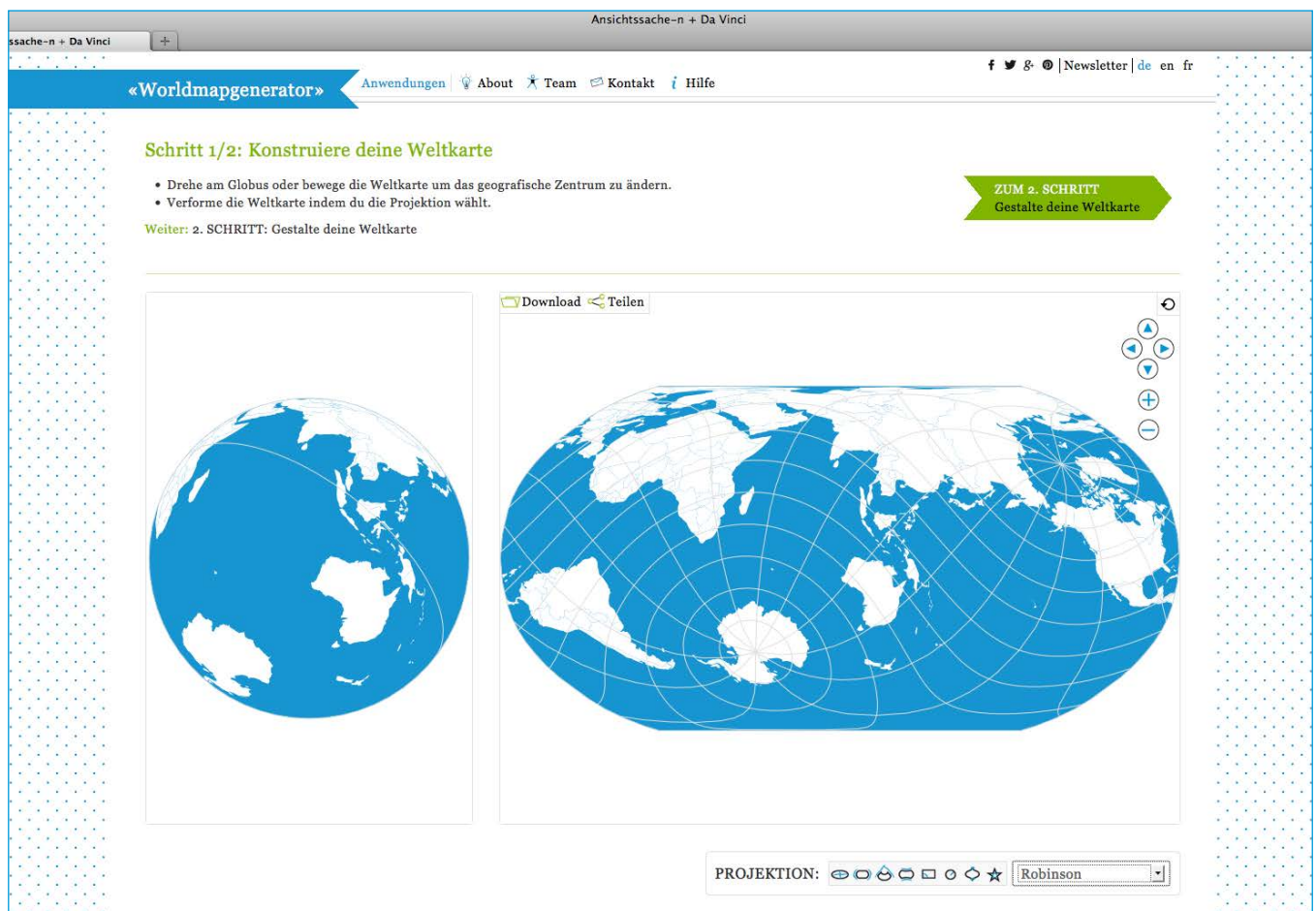
### PROTAGONIST

«Da Vinci» is all about world map construction and design. In a first step, an interactive globe/map function allows the user to acquire a feel for the transition from three-dimensional Earth to two-dimensional map. Pictorial centres can be freely chosen both on the globe and the map. Moreover, the desired projection can be selected from a project-specific set of projection categories.

The second step comprises surface design. For this purpose, design parameters such as colour, pattern and line weight can be used to depict geographical features like land and water masses, grid and national borders. The many parameters available enable designs that put in question current cartographical conventions.



*Da Vinci: Options to design the worldmap.*



*Screenshot of «Da Vinci» with the interactive model globe-worldmap.*

## COMMUNICATION *through* WORLDMAPS

*This Area is devoted to the aspect of communication by means of world maps. «JOURNALISTIN» is implemented in the current software version.*

*Only a minimal set of design parameters and possibilities for geometrical manipulation are offered. Abstract depictions of the Earth's surface are aimed to be perceived as a unity and to accompany a piece of news. Political or geographical information is visualized in such maps; choice of projection and pictorial centre can add visual emphasis to the message conveyed.*

### USERS & TARGET AUDIENCE

This area addresses news agencies. News items as well as feature stories may provide relevant contexts here. For online news, generative procedures using RSS files are thinkable.

### THEORETICAL BACKGROUND

No map of the world is able to treat all geographical areas equally. The distortion necessarily involved in projection means that two-dimensional maps are never wholly neutral representations. Rather, they provide an abstraction which is tied to a certain point in time and which gives representational priority to one or another area. Such weighting results from the placement of the areas within the given format, the focus being on the pictorial centre. This is sometimes consciously exploited to visually emphasize a certain politically informed «world view». Indeed, there is the claim that the «conventional world map» embodies a certain view of global political power distribution. The connection between power issues and world map design has long been subject to developments in the media. Today's new media open up many possibilities that involve individual, user-oriented functions and generative processes. Area 2 draws attention to the problem of power distribution and map design, as well as to media trends with regard to world maps.

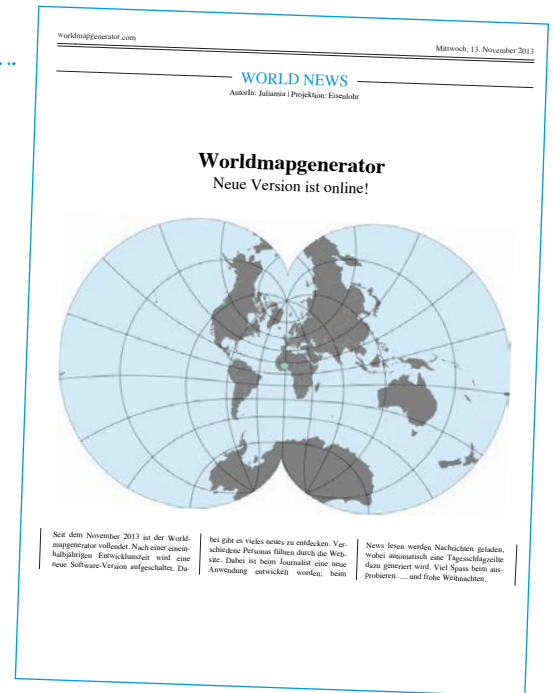




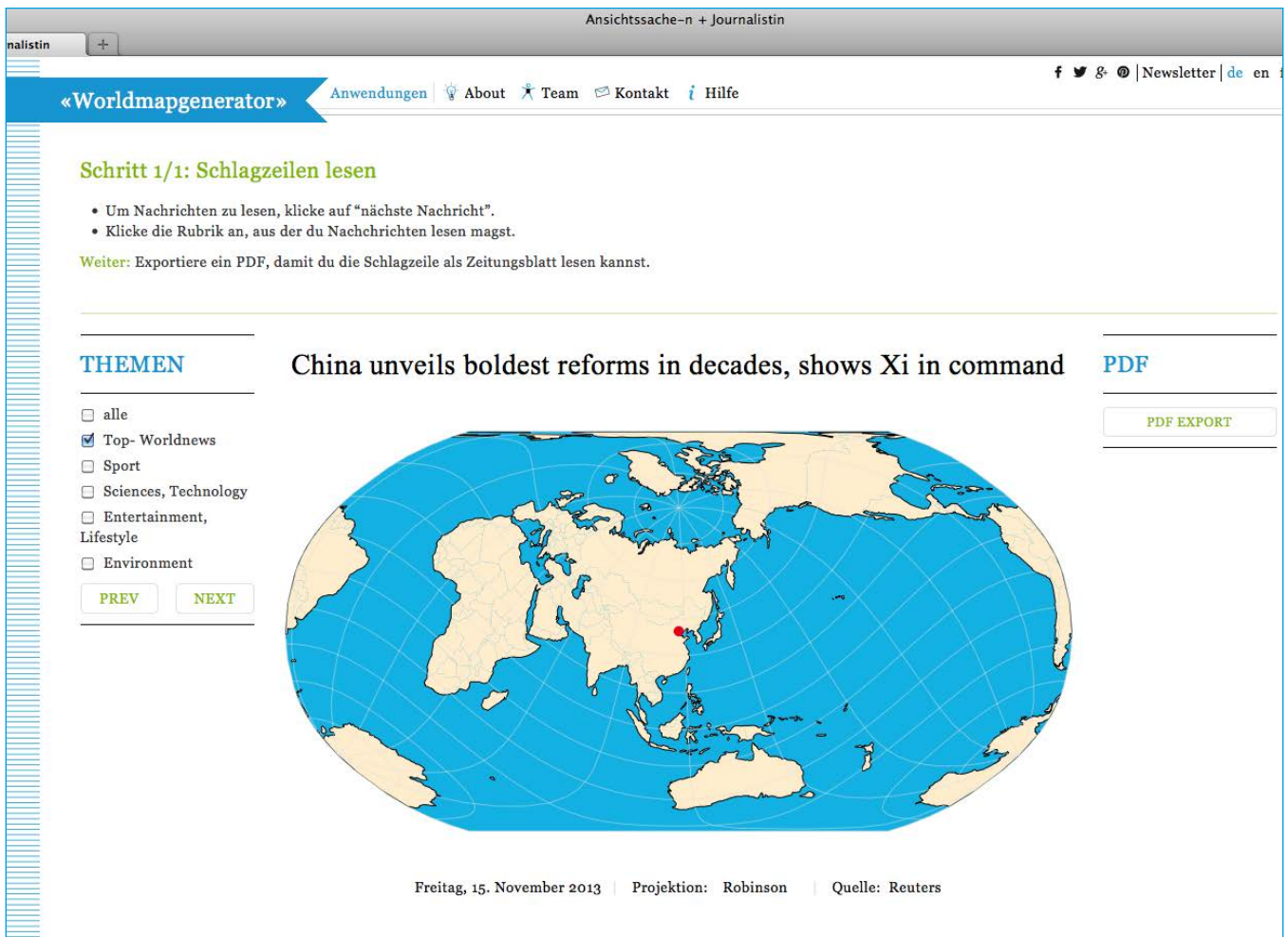
## COMMUNICATION *through* WORLDMAPS

### PROTAGONISTS

The «Journalistin» puts world maps in the context of news journalism. Two procedures are possible: the user may provide her own headlines, or let the software make a suggestion for headlines. In both ways, world maps suited to accompany a corresponding piece of news are generated in which the geographical area at the pictorial centre is made to fit the location of the reported events. The parameters available for the map design are deliberately limited; mostly land masses are to be visible. The «Journalist» also allows an introductory glimpse at the field of generative graphics.



Map Application: Journalist Create Newspaper.



Map Application Journalist Read Newspaper. (Stand: 11.11.13)



## LOCALISATION *in* WORLDMAPS

*This area deals more directly with the issue of viewpoint - the subjective perspective of the map designer. The <TOURIST> is implemented in the current software version.*

### USERS & TARGET AUDIENCE

This area is likely to be of interest to travel agencies or publishers of tourist maps that want to depict routes across longer distances. It might also serve air and space transport organizations when it comes to illustrating flight destinations and orbits.

### THEORETICAL BACKGROUND

World maps are often assumed to be objective, realistic depictions of the Earth's surface; however, neither the mapmaker nor the map reader can assume a wholly neutral position. The subject determines geographical orientation, and her larger perspective depends on sociological and cultural factors. Also, the reading of world maps always involves the subjective image of the world as a point of reference.

The issues of relativity of orientation and subjectivity of perspective is the focus of area 3. They are given prominence by various representations of routes and distances. These can be visualized by means of static or dynamic graphical elements.

### PROTAGONISTS

The <Touristen> allows to mark and measure routes and geographical distances (e.g. Madagascar – Kazakhstan); changes in projection may then lead to different appearances of a route, while distances are preserved. In this way, the tool enables one to link two points by a route, where shifts in projection and pictorial centre produce new visual impressions of the route.





## LOCALISATION *in* WORLDMAPS

### STRECKE

1.STRECKE

Indien - Grönland

8854 km

2.STRECKE

Grönland - Argentinien

12355 km

3.STRECKE

Argentinien - Südafrika

7685 km

4.STRECKE

Südafrika - Timor-Leste

10710 km



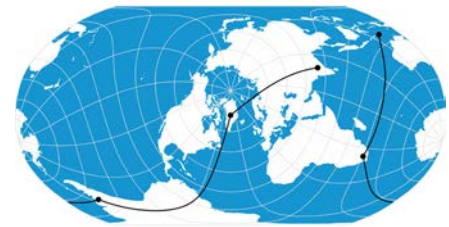
*Azimuth Equal Area*



*Millerprojektion*



*Merkatorprojektion*



*Robinsonprojektion*

Ansichtssache-n + Tourist

stfloor-studio.com/de/tourist#

«Worldmapgenerator»

Schritt 1/1: Visualisiere deine bevorstehende Reise

- Gib die Länder deiner bevorstehenden Reise ein und berechne deine Route.
- Wähle das geografische Zentrum über den Mittelpunkt-Button oder indem du die Weltkarte bewegst.
- Verforme die Weltkarte indem du die Projektion wählst.

Weiter: Speichere oder Teile deine Weltkarte

Download Teilen

STRECKE

- Indien - Grönland  
8854 km
- Grönland - Argentinien  
12355 km
- Argentinien - Südafrika  
7685 km
- Südafrika - Timor-Leste  
10710 km

DESTINATION

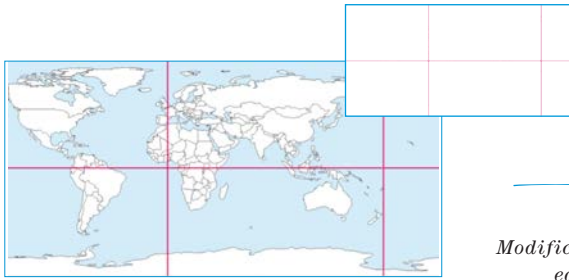
- AUSGANGSPUNKT  
indien  
 mittelpunkt
- DESTINATION  
grönland  
 mittelpunkt
- DESTINATION  
Argentinien  
 mittelpunkt
- DESTINATION  
südafrika  
 mittelpunkt
- DESTINATION  
osttimor  
 mittelpunkt

PROJEKTION: Sinusoidal

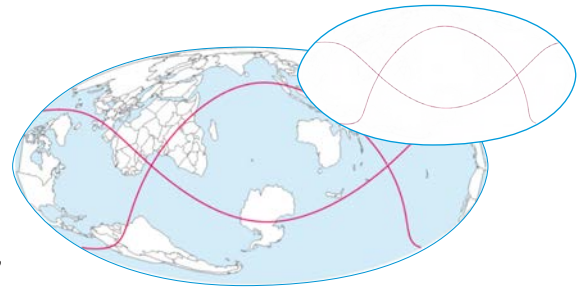
## SOFTWARE FEATURES

### CENTRAL FEATURES OF WORLD MAPS

CONVENTIONAL

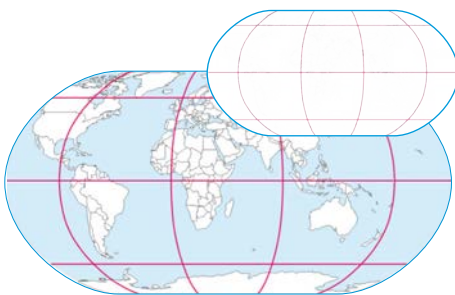


UNCONVENTIONAL

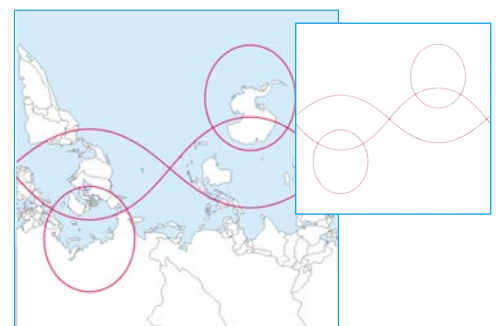


Modification of prime meridian,  
equator and parallels

CONVENTIONAL



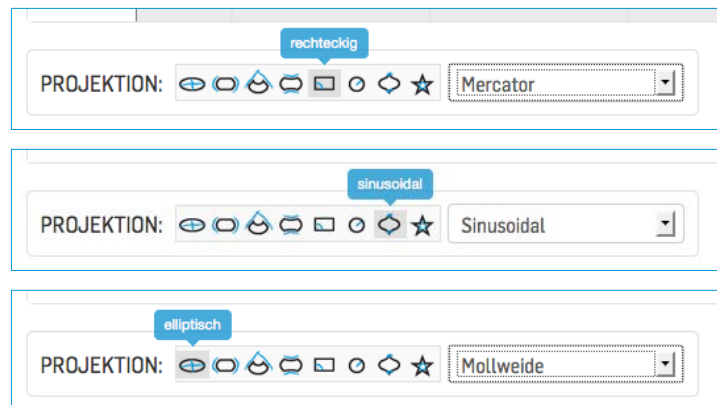
UNCONVENTIONAL



Modification of prime meridian,  
equator and parallels

### PROJECT-SPECIFIC CLASSIFICATION OF PROJECTIONS

There exists a variety of classification systems for projections. Common classifications in cartography rest on criteria related to the technicalities of the projection methods. «Viewpoints» has elaborated its own categorization of projections, based on formal-aesthetic criteria.

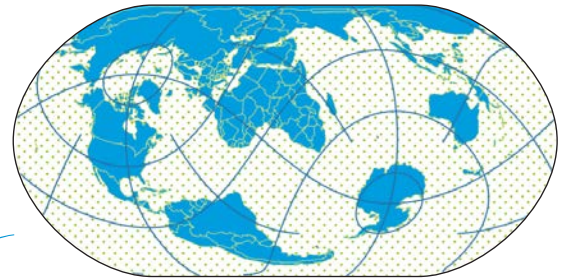


- |  |            |  |                |  |             |  |            |
|--|------------|--|----------------|--|-------------|--|------------|
|  | ELLIPTICAL |  | CONIC          |  | RECTANGULAR |  | SINUSOIDAL |
|  | CURVED     |  | CONVEX-CONCAVE |  | ROUND       |  | SPECIAL    |



## AIMS, INTENTIONS, BENEFITS

- Providing a tool for generating UNCONVENTIONAL WORLD MAPS



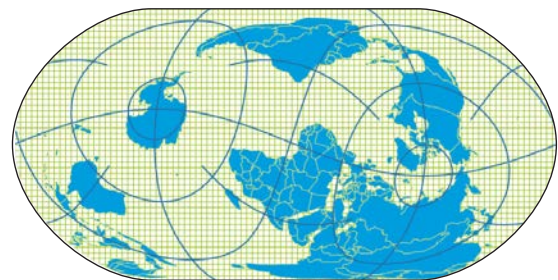
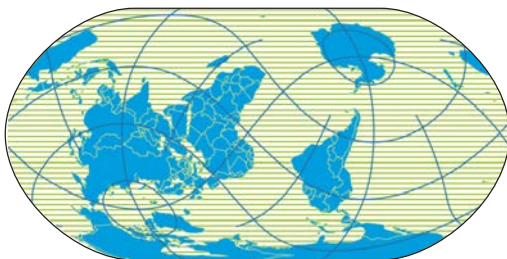
- More conscious application of DESIGN ELEMENTS in cartography

- Increased awareness of the RANGE OF POSSIBILITIES IN WORLD MAP DESIGN, better understanding of the map production process, and a more critical stance towards conventional world maps

- New VIEWS and PERSPECTIVES on pictorial representations of the world

- Interactive FAMILIARIZATION with cartographical issues and the production of world maps

- Publicly available software that provides GRAPHIC DESIGNERS with a tool for creating unconventional world maps. These maps can be exported in JPG, PDF und PNG format and be put to use as GRAPHIC DESIGN MATERIALS



- The possibility of putting unconventional world maps in THEMATIC CONTEXTS