



Geogames

organizer's guide v1.0

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1 *What are Geogames?*

Geogames constitute a subclass of location-based and mobile games which can be played on mobile devices using positioning technology (like GPS) and integrate the players' position and motion track into the game flow.

Through a specific mapping of existing board games into geographical space Geogames combine the strategic aspect of board games with locomotion typical for sportive activities.

Timing is crucial for the success of such games: In order to prevent the possibility of winning the game by just being faster than your opponent Geogames integrate special synchronization mechanisms using quests/tasks. In game-based learning, these in-game quests/tasks provide an opportunity to engage in learning activities. Generally, such activities blend with the gaming experience and are perceived by the players as playing time instead of idle time.

The screenshot on the right-hand side shows an example of one of the first Geogames created at the University of Bamberg. "Geo-Tic-Tac-Toe" is the location-based realization of the very simple game "Three in a row" enriched with quiz questions on a certain topic.



History of Geogames at the University of Bamberg

Starting in 2004, the Geogames team at the University of Bamberg, Germany, has studied and developed this type of location-based games which are used in different educational scenarios.

Currently, The Geogames team cooperates with ESRI Inc. in a project named "Geogames and Playful Geodesign". Educational partners within the Geogames research at the University of Bamberg are the University of Augsburg (geography education) and the PH Ludwigsburg (didactics of natural sciences).

2 *Specific features of Geogames*

Types of Geogames

Geogames may support a variety of context activities or they may draw on specific cognitive or motor skills of their players. They can be played in several educational scenarios and with various ambitions. There are mainly four different types/genres of Geogames:

- **exploration games** for learning how to make use of an existing spatial design (e.g. a campus game for freshmen)
- **feedback games** in which the players report what they experience as the strengths and the weaknesses of a design (e.g. an urban usability game)
- **allocation games** in which the main criterion for winning is to occupy the majority of game location
- **configuration games** in which the main criterion for winning is to occupy specific pattern of game locations

The difference between Geogames and multi-caches

In contrast to multi-caches, where one player (or a team of players) has to search for one cache after another using a GPS signal, in Geogames at least two players or teams of players compete to win the game by being the first to achieve the winning requirement. In addition, Geogames players have awareness of all game locations right at the beginning whereas in multi-cache games one first has to discover the next location during the game.

The players have also a degree of freedom regarding the order in which the different locations are visited. Thus, strategic considerations are a big issue in Geogames.

Educational, social, sportive and place obtained context

Geogames address not only the entertainment aspect of how to create a challenging game or exercise physical fitness. They are particularly interesting for educational projects (e.g. in spatial thinking) because they not only connect the players socially but also connect them with the geographic environment. Therefore they are an ideal platform for “edutainment”—the entertaining combination of playing and learning.

Besides, the edutainment aspects of Geogames address issues like game AI for location-based games, context-aware information push and user interface design.

Integration of educational contents by game tasks

For the timeouts being characteristic for Geogames (see section 4.5) educational contents can be integrated easily into the game flow. Different tasks can be used for different scenarios (e.g. verification tasks, evaluation tasks or photo tasks). The organizer of the game has to provide the tasks for the specific game locations.

For example you can use exploration games for learning how to make use of an existing spatial design or feedback games in which the players report what they experience as the strengths and the weaknesses of a design. Other examples can be educational scenarios like river ecology or cultural heritage.

Such playful approaches do enrich the learning experience in a general curriculum on spatial thinking

and are especially useful where learning at a younger age (10+) is concerned.

Narrative structure

The narrative captures the experiential aspect of the game in form of a fictional context (a story). What matters most in a Geogame is the way in which players connect to the geographic space they move in. It makes, for instance, a difference whether your game is about flowers (immobile objects in a natural environment) or about cars (moving objects in a manmade environment).

It is also possible to define different types of player characters (e.g. navigator, security chief, see section 4.3)

The main storyline is communicated to the players by the game organizer and the player's guide of the specific game.

3 *Preparing a Geogame event*

This product portfolio shall serve as a decision support for organizers to understand how well the game design aligns with the goals of his/her planned context activity. Every game is introduced in the following table with its main elements and specific features. Additionally, the basic data is summarized. You will find more details about the individual points as well as the rules of the game, possible variations and strategic considerations of the respective play in the game-specific player's guide.

Overview of already existing Geogames

		City Poker	Neocartographer	GeoTicTacToe
What is it all about?	idea of the game and game description	In city poker, two players or teams of players compete, each trying to outperform the opponent by gaining the best possible poker card combination. This is done by swapping poker cards, which are hidden at special locations, in a preferably clever way.	In Neocartographer, two players or teams of players compete, each trying to outperform the opponent in a mapping contest where a player gains an advantage by being the first to contribute a piece of information about a geographic location. (The aim is to reach a special winning configuration of the allocated areas.)	In GeoTicTacToe, two players or teams of players compete, each trying to outperform the opponent in a mapping contest where a player gains an advantage by being the first to contribute a piece of information about a geographic location. The aim is to reach the typical configuration of tic-tac-toe (three points in a row).
	game genre	configuration game	allocation/configuration game	allocation/configuration game
	narrative focus	based on a well-known game; no particular narrative focus	based on a narrative focusing on collaborative mapping and the competitive aspects which this sometimes involves	based on a well-known game; no particular narrative focus
Who plays?	amount of players and target group	two players or teams of players (up to 10 players)	two players or teams of players (up to 10 players)	two players or teams of players (up to 10 players)
	required previous knowledge	players do not need any prior knowledge	The players do not need any prior knowledge.	The players do not need any prior knowledge.
How long?	duration of the preparation	ca. 1 h preparation time	ca. 30 min preparation time for a typical game with 10 locations	ca. 30 min preparation time
	duration of the game itself	briefing phase: about 10 minutes playing phase: about 60 minutes debriefing phase: at least 5 minutes	briefing phase: about 5 minutes playing phase: about 30 up to 60 min. debriefing phase: at least 5 minutes	briefing phase: about 5 minutes playing phase: about 30 up to 60 min. debriefing phase: at least 5 minutes
	duration of the postprocessing	collecting the hidden poker cards	—	—

Where?	number of locations and size of the area	5 big geographic locations (not necessarily directly next to each other); in each area additionally 3 caches (circles with a radius of ca. 15 meters)	9 to 16 geographic locations in a 1.5 km x 1.5 km square	9 geographic locations in a 1.5 km x 1.5 km square
	relocation	relocatable Geogame	relocatable Geogame	relocatable Geogame
What is needed?	mode of locomotion	conceived as a pedestrian game; no further equipment needed	conceived as a pedestrian game; no further equipment needed	conceived as a pedestrian game; no further equipment needed
	required (technical) equipment	two Android smartphones; eventually poker cards and printed PIN numbers	two Android smartphones; no further equipment needed	two Android smartphones; no further equipment needed
What has to be done before starting?	required skills of the organizer	<ul style="list-style-type: none"> • sufficient knowledge about the geographic environment • local knowledge to formulate location specific quiz questions (tasks) • technical skills and background knowledge about spatial analysis that match those of the players 	<ul style="list-style-type: none"> • sufficient knowledge about the geographic environment • local knowledge to formulate location specific quiz questions (tasks) • technical skills and background knowledge about spatial analysis that match those of the players 	<ul style="list-style-type: none"> • sufficient knowledge about the geographic environment • local knowledge to formulate location specific quiz questions (tasks) • technical skills and background knowledge about spatial analysis that match those of the players
	Things to prepare (details in the game-specific manual!)	<ul style="list-style-type: none"> • specify 5 big geographic locations and in each one three caches. • put in one cache per big geographic location two poker cards • check that a sufficiently strong GPS signal is received at all locations • provide one task description per location with two false and one right answer 	<ul style="list-style-type: none"> • specify 9 to 16 geographic locations • check that a sufficiently strong GPS signal is received at all locations • provide one task description per location with two false and one right answer 	<ul style="list-style-type: none"> • specify 9 geographic locations (approaching a square raster) • check that a sufficiently strong GPS signal is received at all locations • provide one task description per location with two false and one right answer

Players and organizers

In most cases two players or teams of players compete in a Geogame contest. If a game is played by teams, sizes of two to five players are ideal. It is not advisable to have teams with more players because not all of the participants will be able to enjoy the playing experience (e.g. a big group cannot look at the display of a smartphone at the same time). Dependent on the narrative structure and the goal of a geogame event, different roles can be associated with the players of one team. For example, the following roles there can be applied to a team of three players:

- a **smartphone agent** who is responsible for carrying the smartphone
- a **navigator** who directs the whole team to the next location on the map
- a **security agent** who is responsible for the safety of the whole team (staying together, not running over red lights, ...)

In such cases the strategic decisions are usually made by the whole team while every single player has an additional duty. This leads to a psychological effect making the players feel needed and ensures that nobody is excluded from the actual play.

Furthermore most Geogames require one or more organizers or game masters for preparing the game with geo-content; for choosing, inviting and briefing the players; for starting, monitoring, ending the game and debriefing the players. The organizer may be a school teacher (e.g. for a biology field trip game) or a tourist guide (in case of a city exploration game).

Some game designs require additional assistants, for instance, supervisors and referees, too.

Geo-content and game relocation

Geogames exploit knowledge about the geographic environment in order to enrich the game playing experience. In the simplest case, the geo-content consists just of a selection of points of interest at which the players perform some task such as taking a photo. Location-specific quiz questions involve more elaborate geo-content. Some Geogames are specifically designed to exploit the unique features of a single place on earth. Most Geogames, however, can be relocated to different geographic regions.

Usually you can use a 1.5 x 1.5 km²-area for a game-duration of 30 up to 60 minutes. For further information about the size and the kind of a suitable game field, see the game specific manual.

Temporal balance and duration of Geogames

The temporal balance of the game flow is crucial for the successful staging of Geogames. Timing in Geogames is mediated by the site-specific tasks which delay the game flow with the effect of combining real-time and turn-based game elements. It follows the Geogames principle that the verification tasks consume time with the simple consequence that it becomes impossible to win the game by just moving faster than your opponent.

Technological and other equipment

To play a Geogame not much of equipment is required. For the most Geogames only two Android devices are needed with GPS localization switched on. Further equipment can be segways or similar, in the case that the game is not designed as a pedestrian game.

4 *Contact and further reading*

If you want to have more information or want to get more impressions about Geogames you are invited to use the following list:

Contact person for all questions concerning Geogames

Prof. Dr. Christoph Schlieder
An der Weberei 5, 02.033
Phone +49 - 951 - 863-2840
Fax +49 - 951 - 863-5841
Email christoph.schlieder@uni-bamberg.de

Website and email of the Geogames team

<http://geogames-team.org/>
geogames@uni-bamberg.de

Press

“Mit Geogames durch das Welterbe” (german): <http://www.uni-bamberg.de/kommunikation/news/artikel/mit-geogam/>

“Mit dem Fahrrad zum Karo-Ass” (german): <http://www.spiegel.de/spiegel/print/d-52485441.html#>