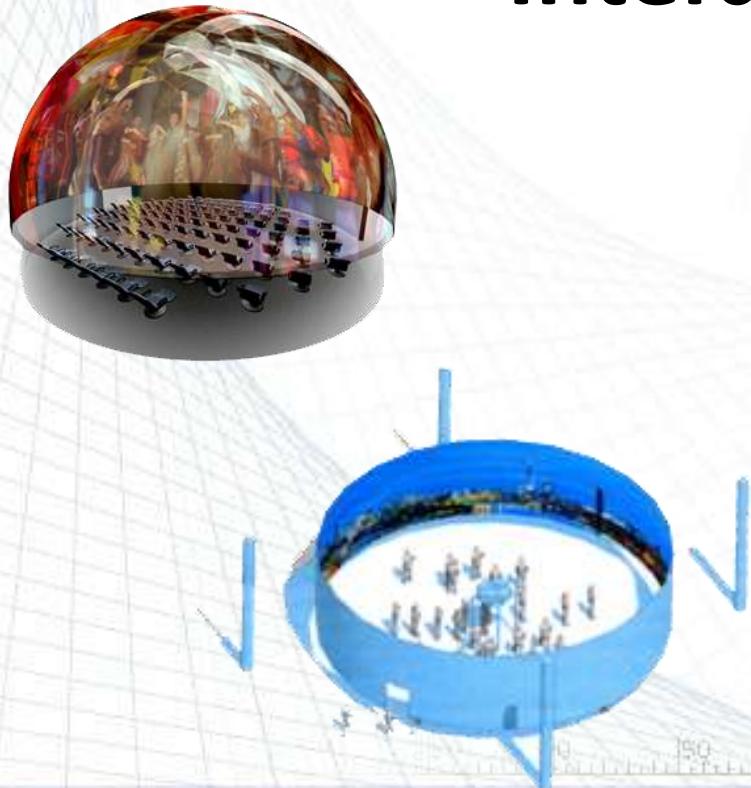




Interaktywność i immersja



Karol Kwiatek

Karol.Kwiatek@gmail.com

Plan prezentacji

1. Wstęp
2. 360°
3. Nawigowalna przestrzeń a film interaktywny
4. Interaktywność w świecie 360°
5. Jak nagrywać interaktywne filmy 360°?
6. Jak oglądać interaktywne filmy 360°?
7. Przykłady interaktywnych filmów 360°
8. Podsumowanie

1. Wstęp

Karol Kwiatek

ART – immersive media

2007-2013 – Plymouth University (UK)

TECHNOLOGY - photogrammetry

2004-2005 – Dresden University of Technology (GER)

2000-2004 – University of Science and Technology (PL)

BUSINESS – 360° photography

19 websites published (since 1997)

3 business awards

4 virtual tours published on CDs/DVDs



Mikropredsiębiorca

**Microentrepreneur
of the Year 2006
(Poland)**



**Best Student
Paper Award (2009)**



**Postgraduate Research
Student of the Year 2010**



**Business Ideas Challenge
Creative Award
and First Place (2008)**



*"Some day in the not too distant future
you'll be able to go to a movie and
the movie will be all around you.
The movie will be over your head,
it will be 360 degrees around you"*

Steven Spielberg, TIME Magazine, 2006

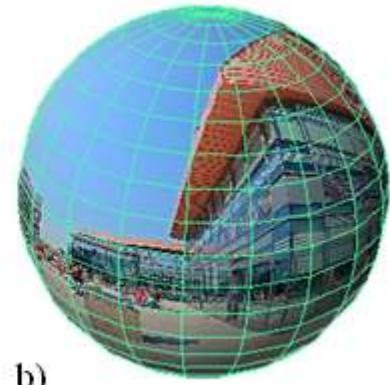


*Pewnego dnia w niedalekiej przyszłości
Będziesz mógł iść na film
i film będzie dookoła Ciebie.
Film będzie dookoła Twojej głowy,
będzie 360-stopni dookoła Ciebie.*

2. 360°

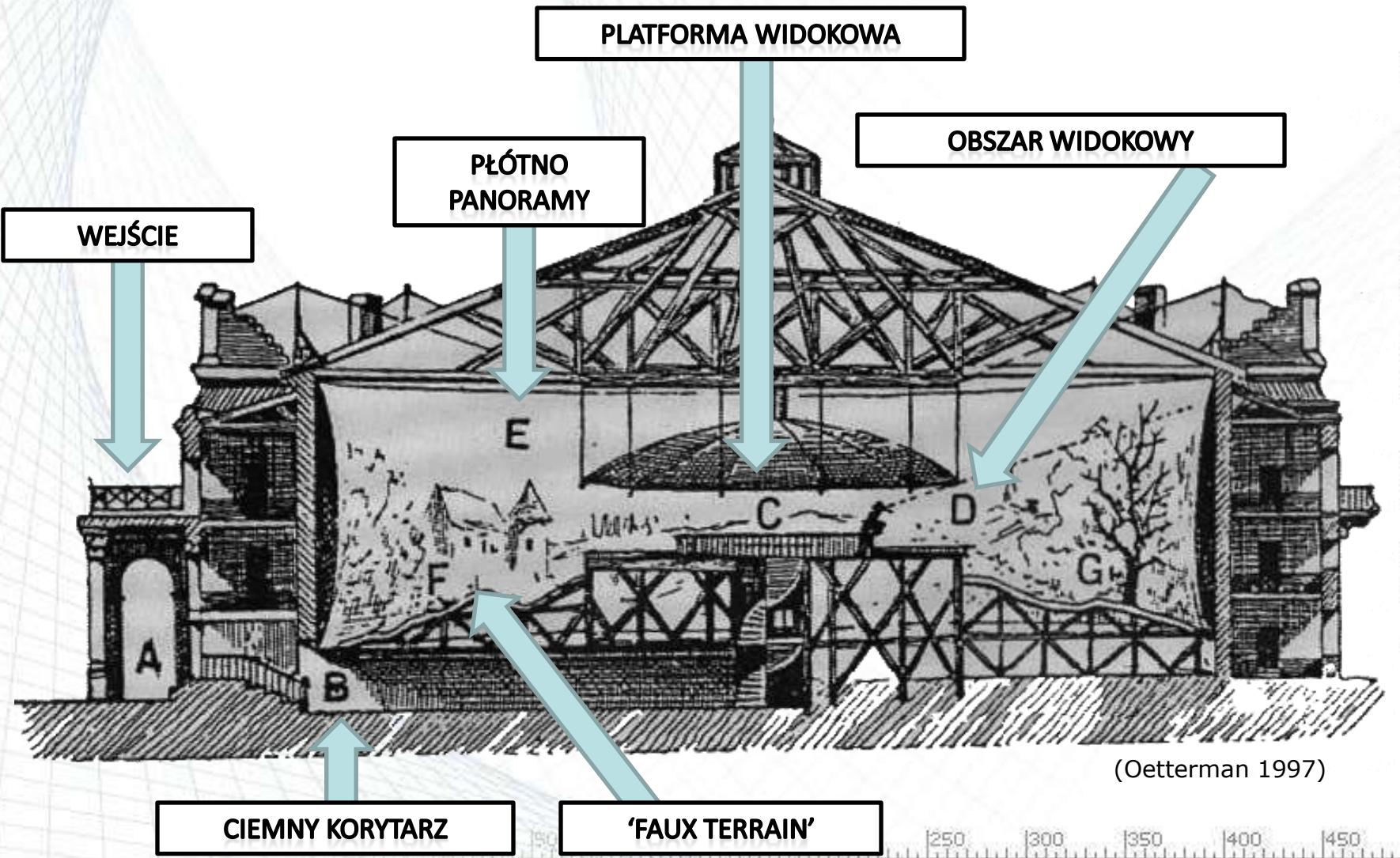


a)



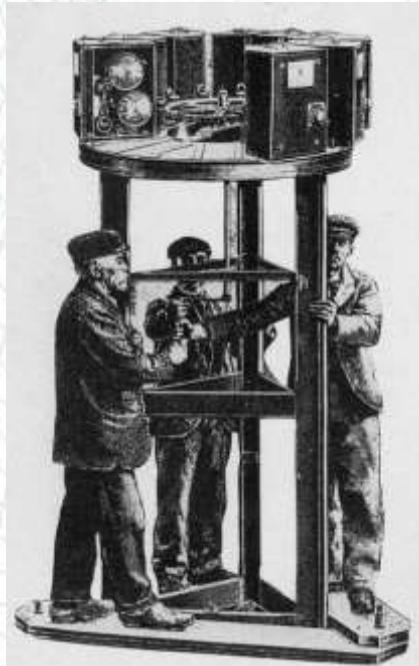
b)

Rotunda w XVIII/XIX wieku

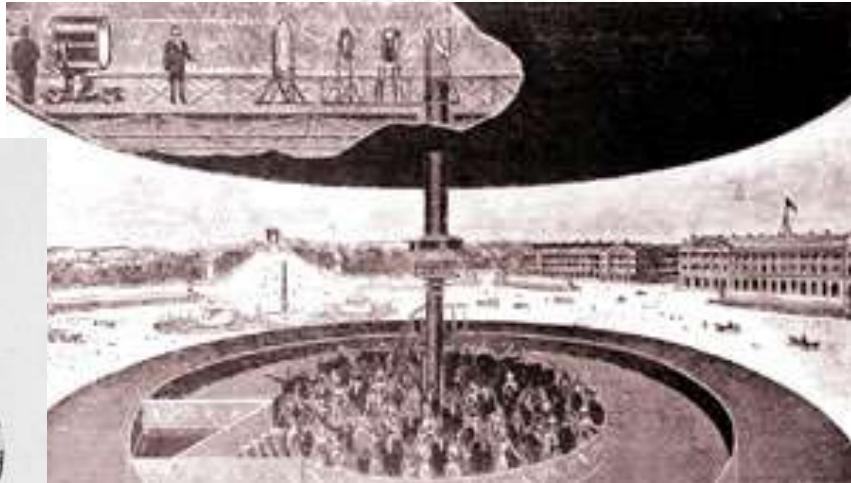




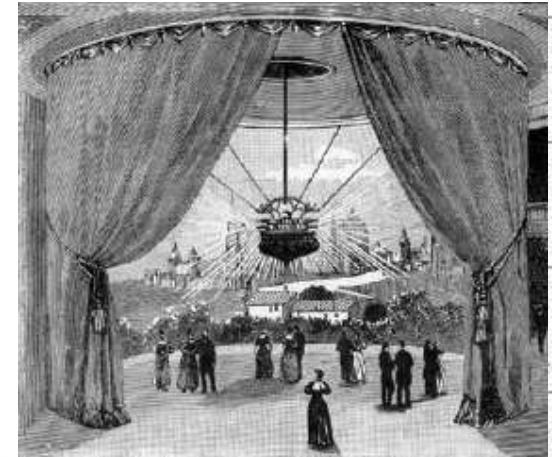
Rotundy w XX wieku



System nagrywający
360° w 1900 roku



Photorama 1900



Stereopticon 1894



Circarama 1950



Kinopanorama 1960

Rotundy w XXI wieku

Cylindrical screens



Rotundy w XXI wieku

EXPO 2012



Immersja



10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
280
290
300
310
320
330
340
350
360
370
380
390
400
410
420
430
440
450

Świat w 360°



cyclomedia

NORC
see. look. explore.

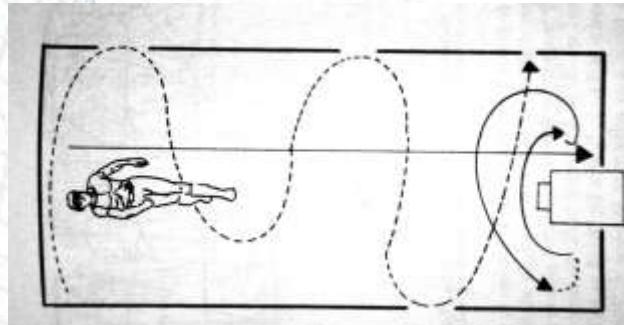
Google
Street View



Świat w 360°

Ruch widzów = Ruch kamery

Kamera jest widzem



Jak
filmować?



3. Nawigowalna przestrzeń a film interaktywny

Nawigowalna przestrzeń

Lata 1980/1990 – animacja komputerowa



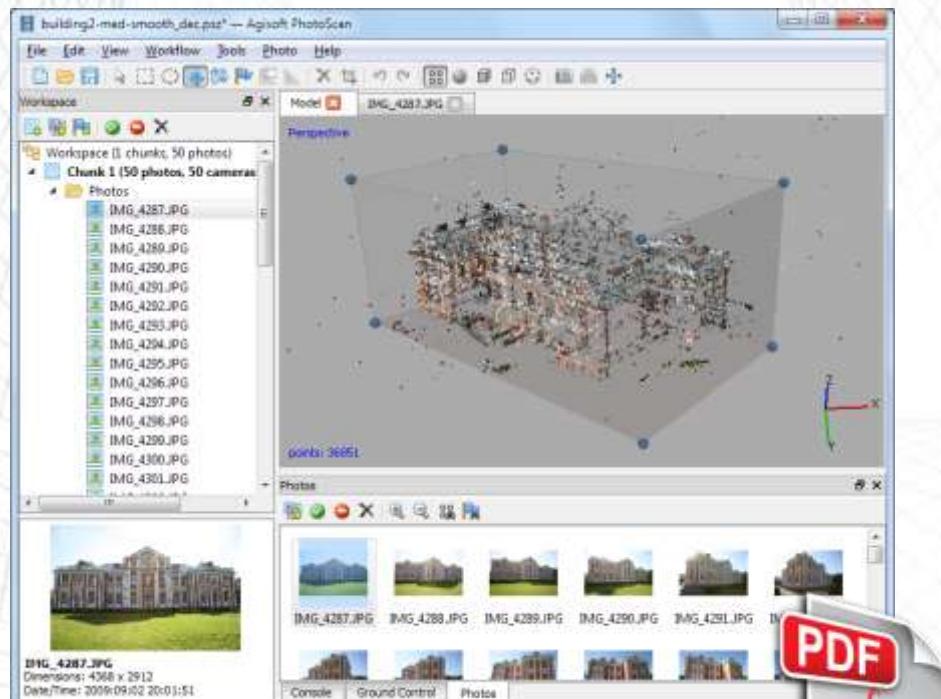
Lata 1990/2000 – symulatory ruchu, doświadczenie podrózowania w pojeździe, VRML, trójwymiarowe przestrzenie



Lata 2000/2010 – nawigowalna przestrzeń połączona z bazą danych, interaktywne panoramy, QTVR



Lata 2010/2020 – konstruowanie przestrzeni z tysięcy zdjęć lub klatek filmowych filmowych, panoramiczne video



Gry?



Film?

Film interaktywny

'time-based representation of character and action in which a reader can affect, choose, or change the plot' (Meadows 2003)

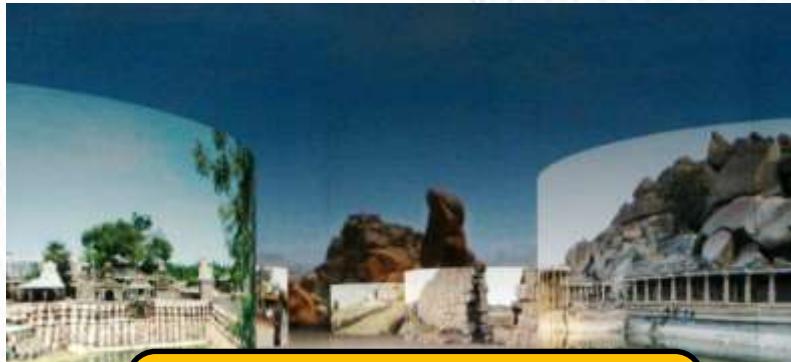
Time-based representation of events

'formulation of old media practices - embodied by the narrative conventions [...] reapplied in the context of new media, with the user positioned as interpreting a meaningful narrative via the **navigation of largely pre-scripted paths through data**'

(Brown, Barker & Del Favero, 2011).

Spatial representation of events

Interactive film



Time-based representation of events

VR approach



Spatial representation of events

Camera-based approach

Camera-based approach

- Street-level navigation and interaction

Aspen Movie Map



StreetView



Panoramic int. film



Photographs

1978

Panoramas

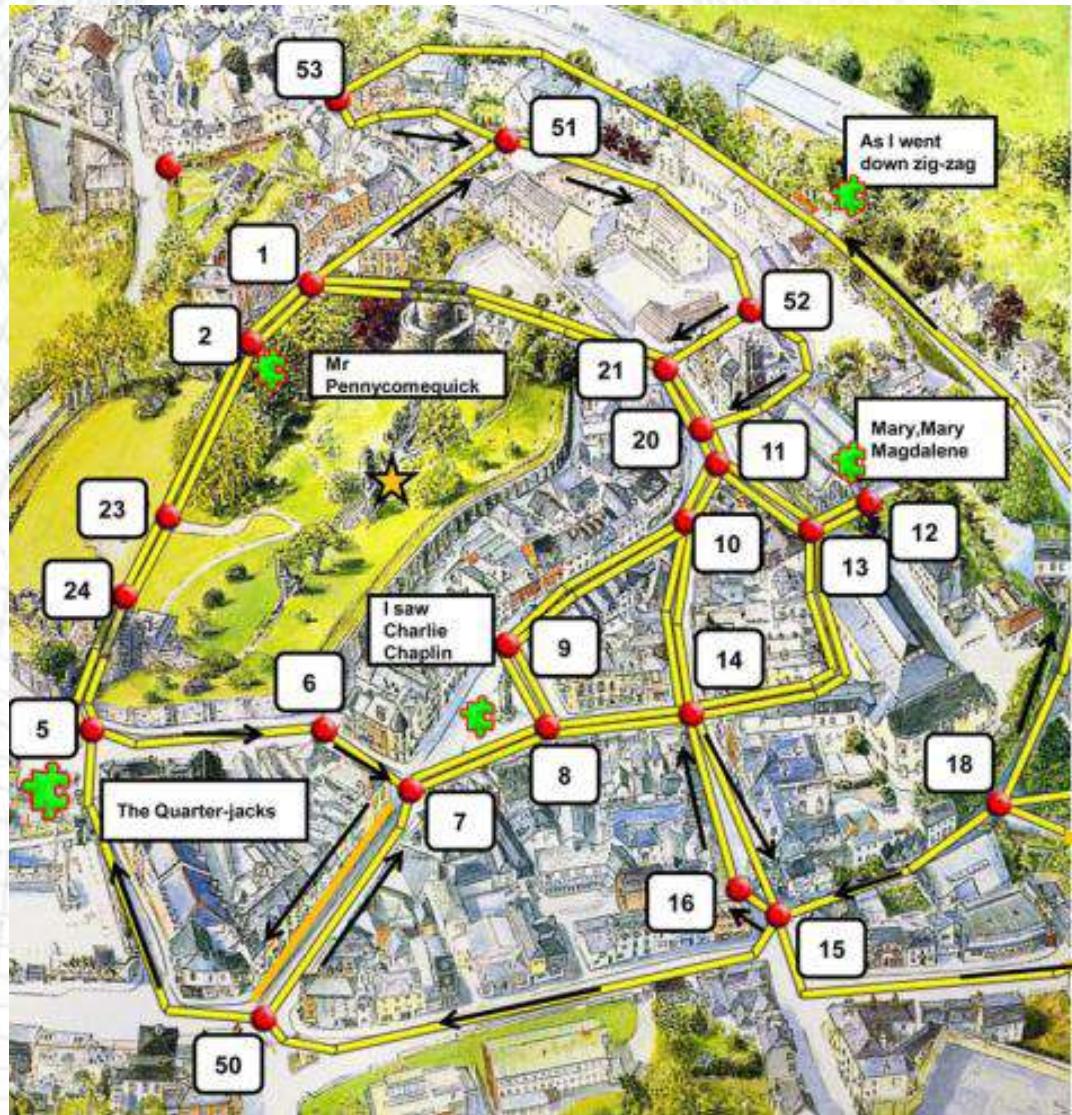
2007

Panoramas & video panoramas

now

- ‘Photographic exploration could open unique esthetical possibilities that cannot be achieved in 3D computer graphics’ Manovich (2001)

Panoramic interactive film



Charles Causley Project



38 video panoramas
33 panoramas

400 450

4. Interaktywność 360°

Typy interakcji

1) 'reactive interaction'



which **does not require much action** from the user.

This is very simple and low level interaction similar to controlling a TV using a remote control

Typy interakcji



2) 'random selection among many alternatives'

- providing the **option** of clicking on and **manipulating** objects or by **choosing** the direction of movement
- **can't foresee** the consequences of actions



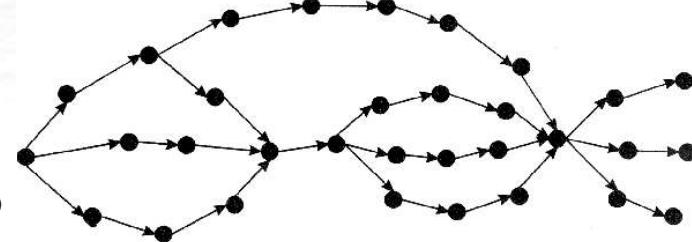
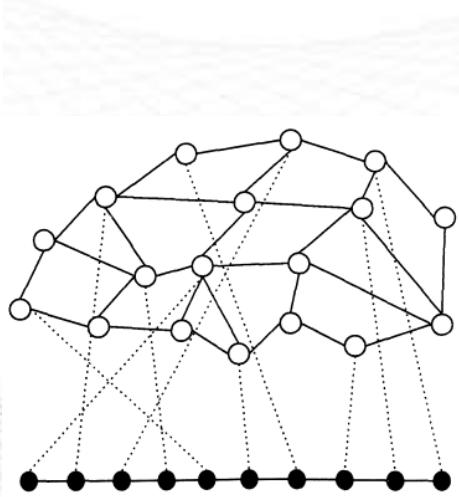
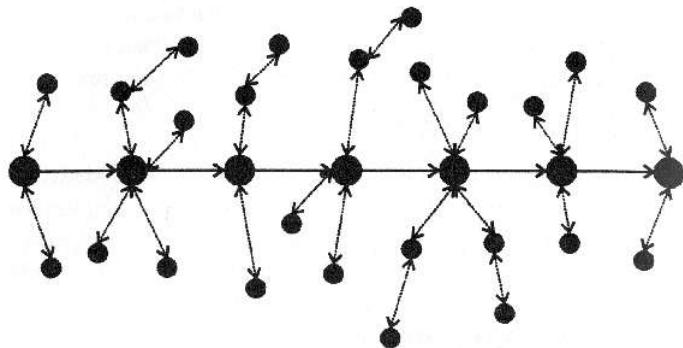
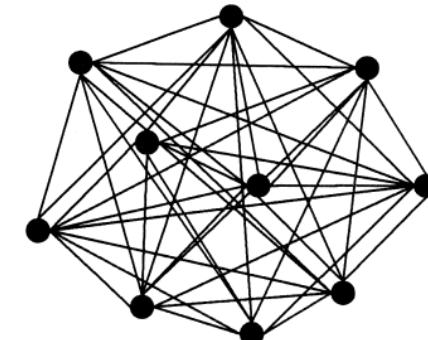
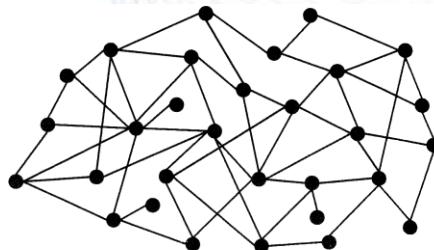
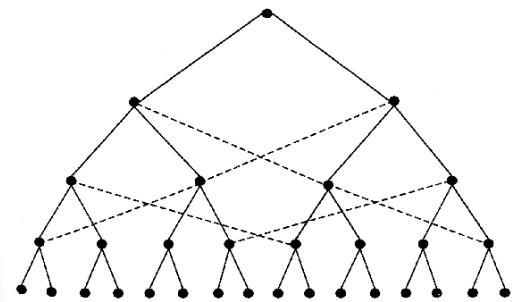
Typy interakcji

3) 'user's involvement in a productive action that leaves a durable mark'

(Ryan 2001)



Połączenia w filmie interaktywnym



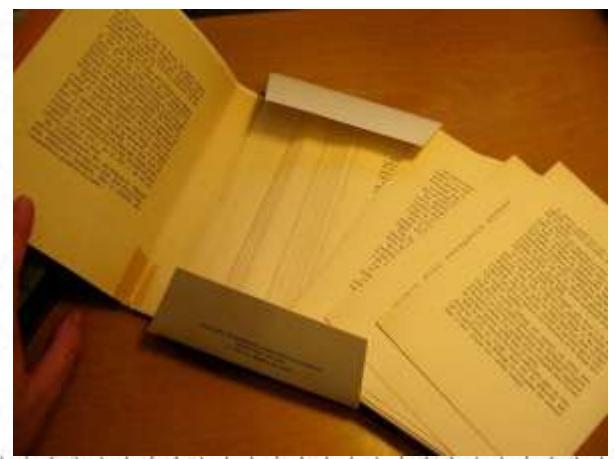
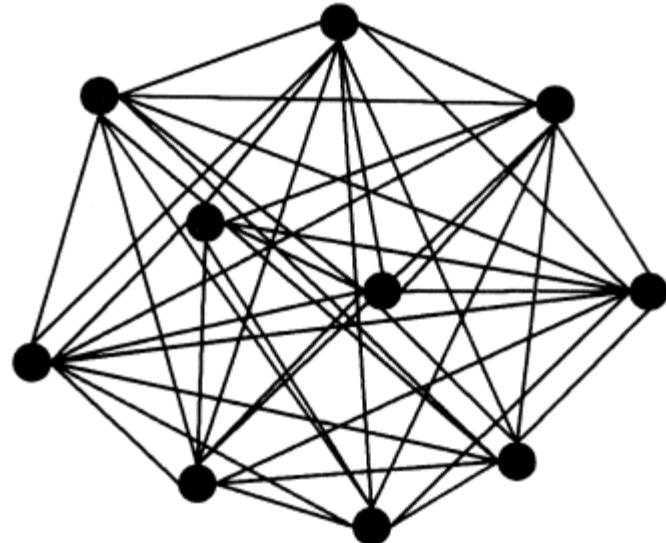
(Ryan 2001)

250 300 350 400 450

Branching story graphs (1)

- The complete graph

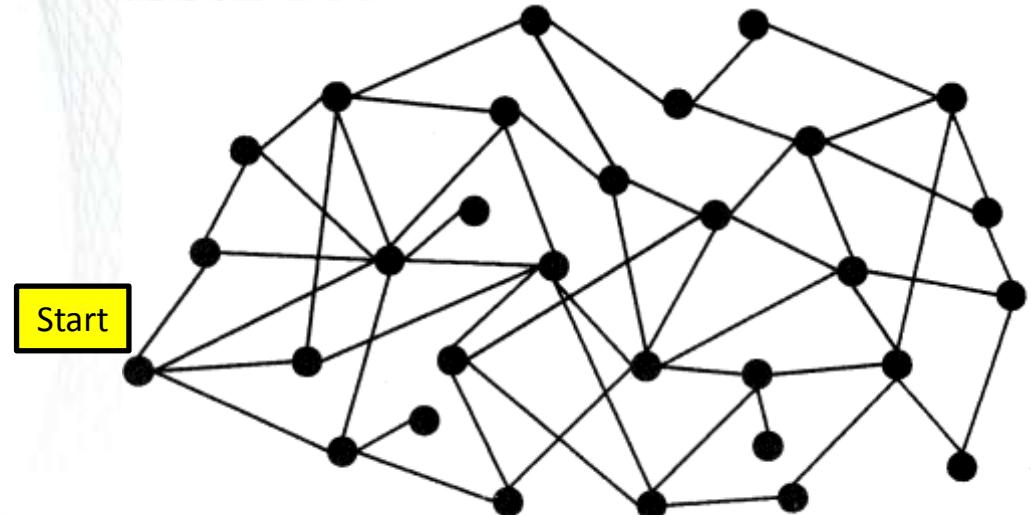
- Paths are bidirectional
- Reader has total freedom of navigation
- Practically impossible to guarantee narrative coherence



Example: Marc Saporta's *Composition No 1*

Branching story graphs (2)

- The Network



- Paths can be uni- or bidirectional
- The network allows circuits
- System cannot control the duration
- Narrative continuity can be guaranteed only on the local level

Branching story graphs (3)

- The Tree

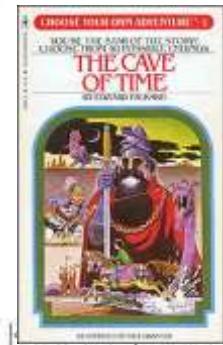
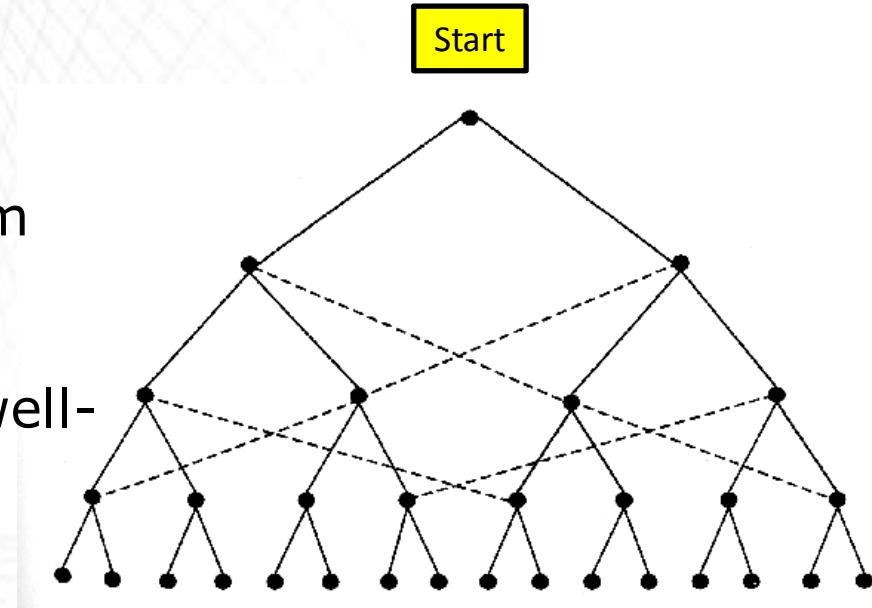
- Paths are unidirectional (from top to bottom)

- Every traversal produces a well-formed plot

- No circuits

- No return to the decision point

- Well formed story is not guaranteed



Example: *Choose Your Own Adventures*



<http://www.survivetheoutbreak.com/>

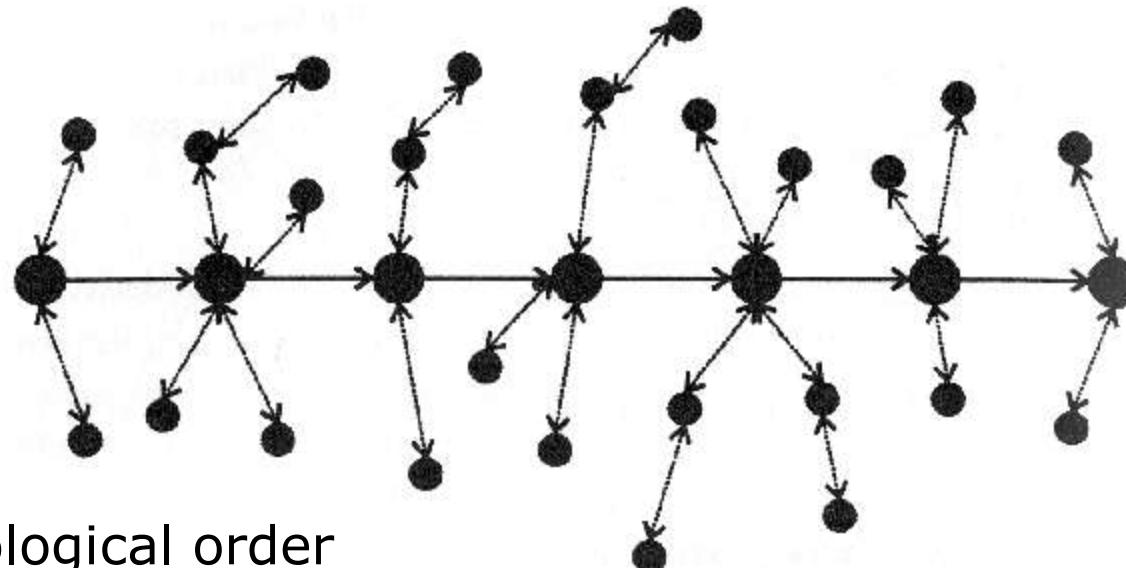
(Ryan 2001)

Branching story graphs (4)

- The Vector with Side Branches

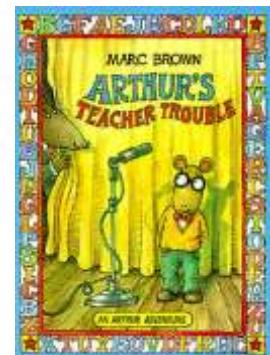
Guided tour

Hidden surprises



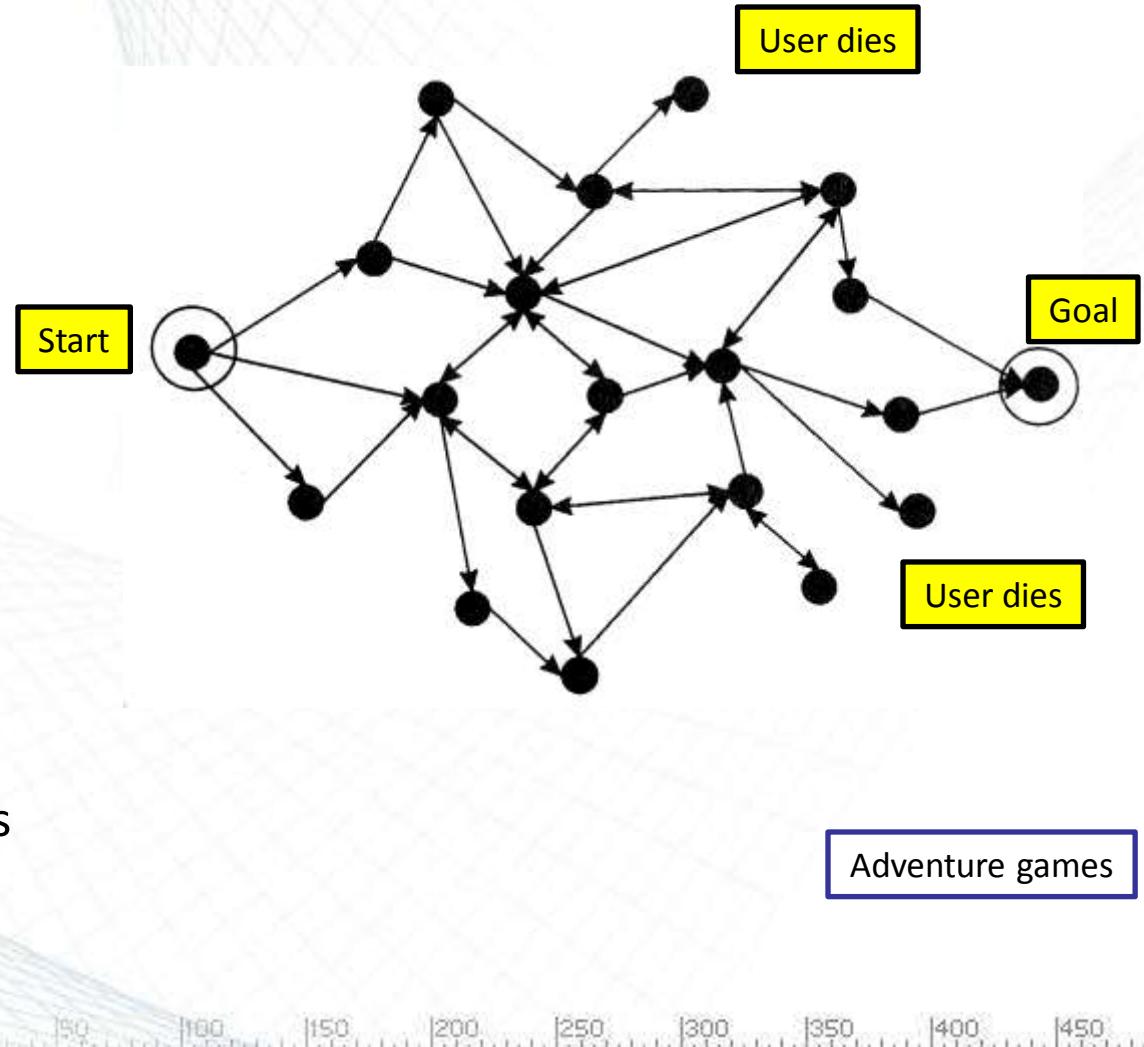
Example: *Arthur's Teacher Troubles*

- Chronological order
- Take short side trips to roadside attractions
- Within each module you can choose your own path



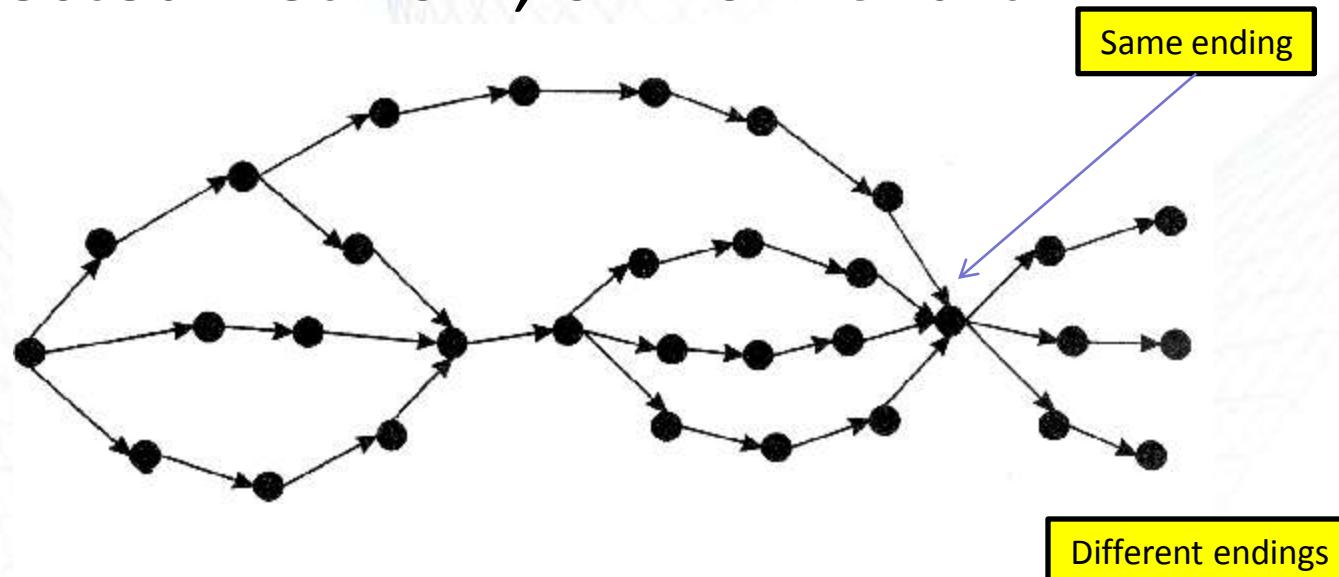
Branching story graphs (5)

- The Maze



Branching story graphs (6)

- The Directed Network, or Flow Chart



- Progression of chronological sequence
- The user is granted some freedom

Example: *The French Lieutenant's Woman*

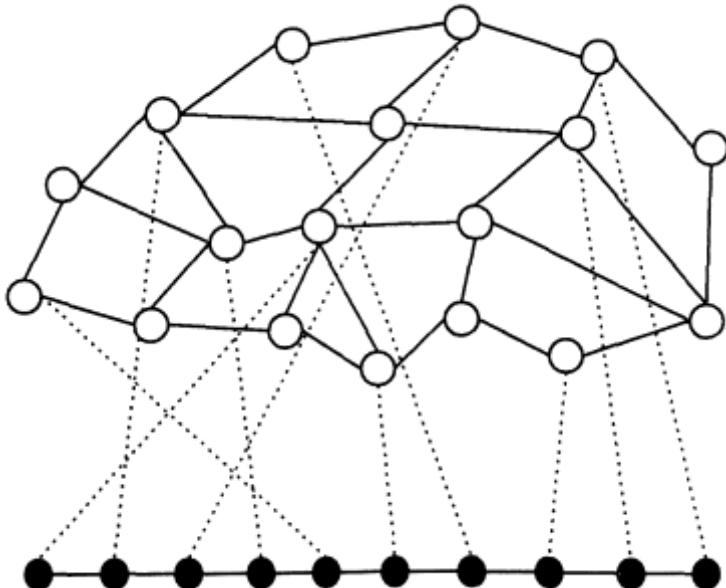


(Ryan 2001)

Branching story graphs (7)

- The Hidden Story

Spatial path of reader's investigation



■ Interactive mystery stories

■ Two narrative levels: at the bottom, the fixed, linear story; on top: the network of choices

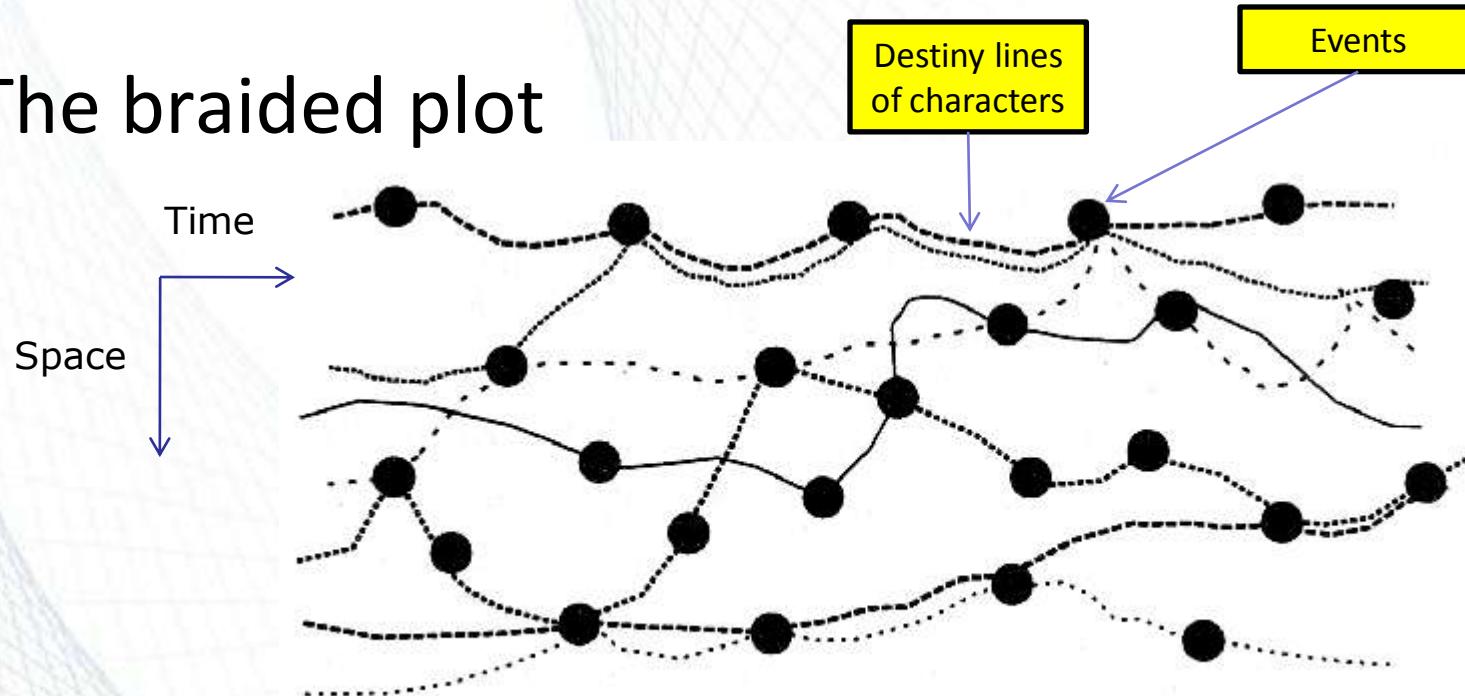
■ Narrative is written by the actions and movements performed by the player



Example: *Myst*

Branching story graphs (8)

- The braided plot

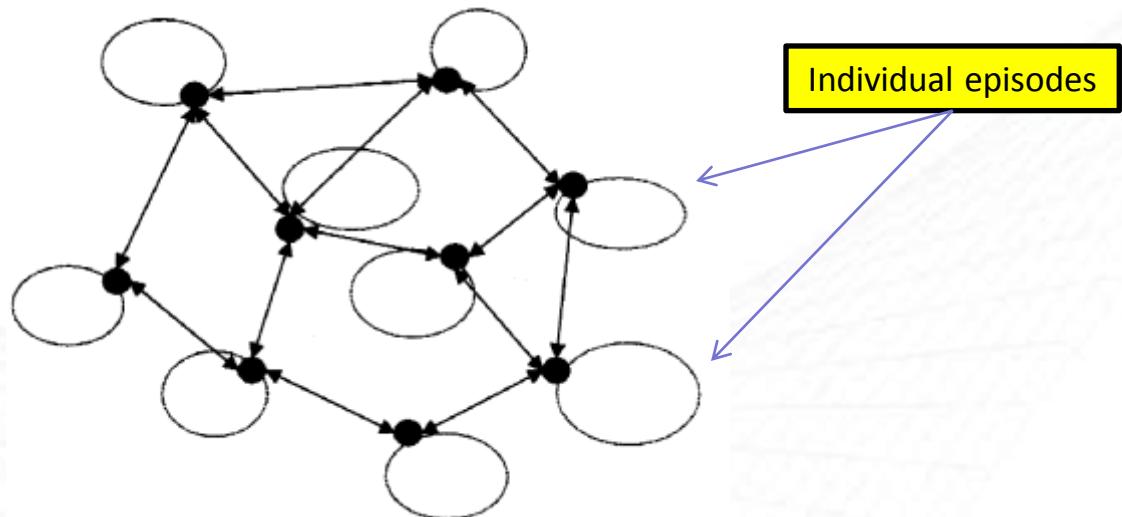


- Simultaneous events are vertically aligned
- Events that take place in the same location occupy the same horizontal coordinate

Example: *The Lurker Files* by M. Ceratini
(a campus-life mystery)

Branching story graphs (9)

- Action Space, Epic Wandering, and Story-World



- The user is free to take any road, but when he/she reaches a site, the system takes control

Example: *Hypercafe* by G. Landow
(a campus-life mystery)

4. Jak nagrywać interaktywne filmy 360°?

Kamery 360° video



Cineorama (1900s)



Sony Bloogie



Ladybug2



Ladybug3



Dodeca



SA9



Sensocto



Totavision



Ladybug 3 spherical video camera

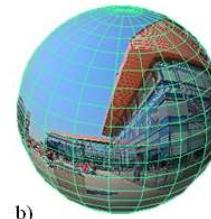


- Max. framerate: 16 fps



- 2.41 kg

- max. resolution: 5400x2700 pixels



Approx.
3GB/min

<http://www.ptgrey.com/products/ladybug3/index.asp>

Multiple cameras



360° films (static)

Spin the camera
around

Zoom in

Zoom out

Control timeline



Ladybug cameras from Point Grey Research

360°films (moving)

Spin the camera around

Zoom in

Zoom out

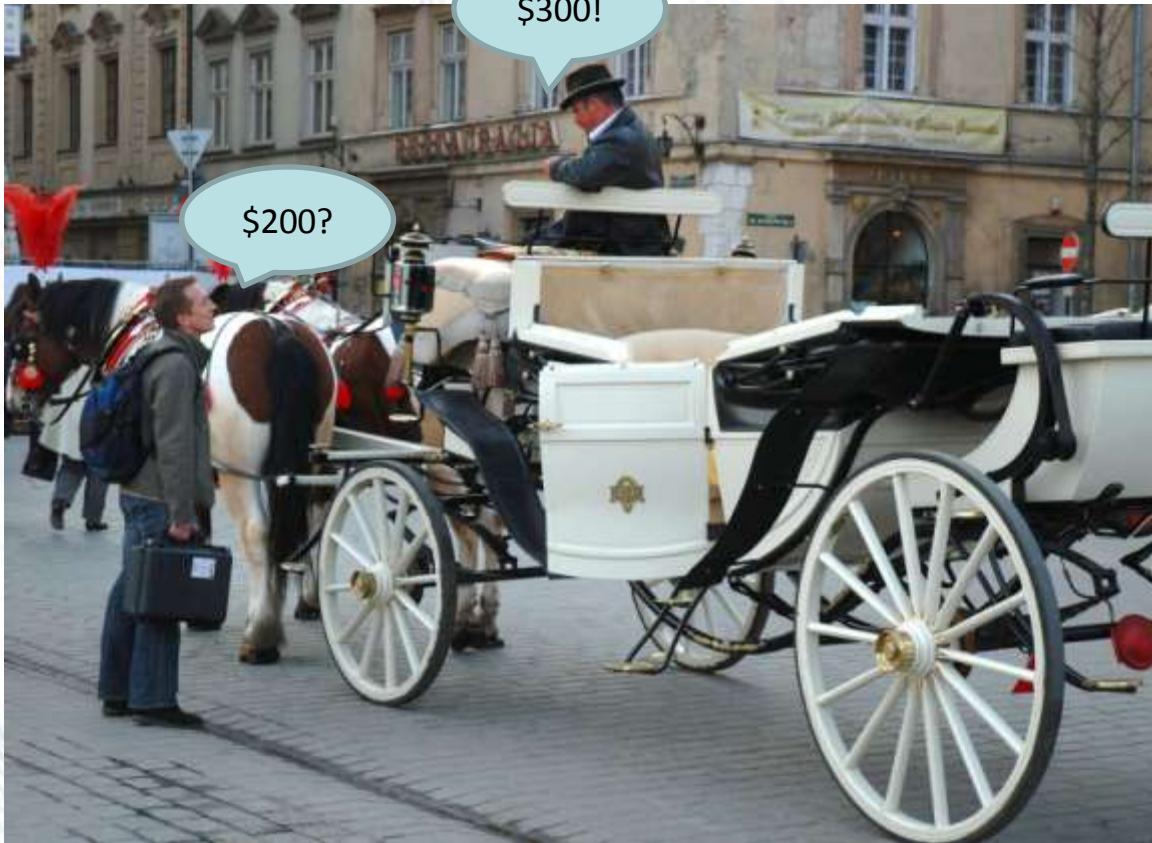
Control timeline

Quasi navigation

Choose trajectories



‘Discover Krakow’ – film 360°



1. Negotiations

Preparation for the journey



2. Camera operator + 5 friends (to hold the tripod)

Preparation for the journey



3. Setting up the equipment

Preparation for the journey



4. The last connections...and go...

Recording music & voice

- A student is creating and voice-over for the 360° film



Synchronising
voice with
360°video

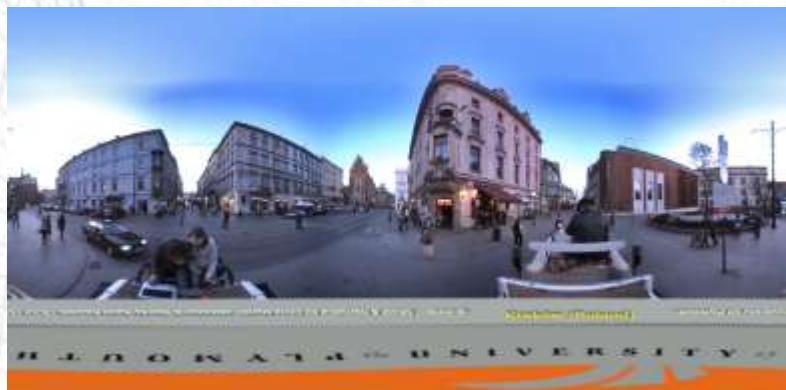
Nadir image



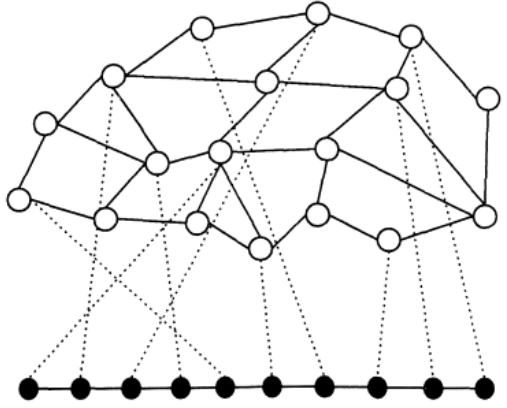
- Panoramic image with a merged nadir image



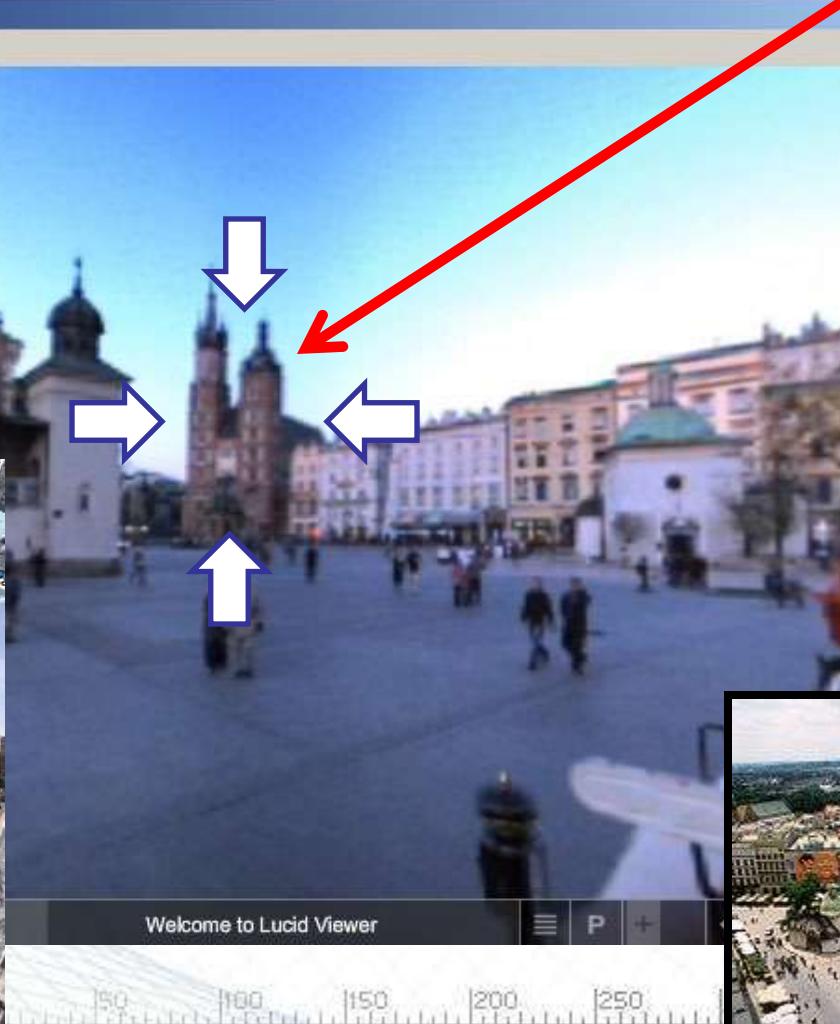
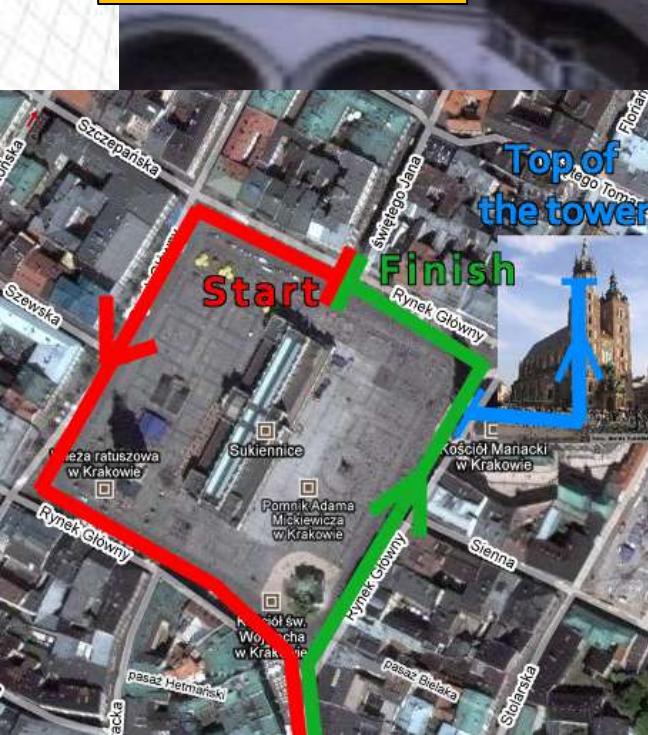
Interactive tour



Developing the narrative



The Hidden Story



View from the tower

Developing the narrative



5. Jak oglądać filmy 360°?

Jak oglądać filmy 360°?

Panoramic viewer



Tablet computer



Immersive screen



0 50 100 150 200 250 300 350 400 450

Panoramic viewer



Video sferyczne



np. przeglądarka panoramiczna



media



index



license



lucid



lucid



lucid

database

XML file

360stories.net

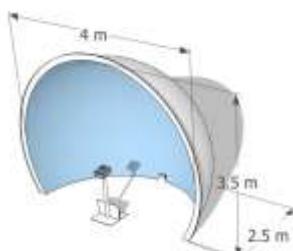
The screenshot displays the homepage of 360stories.net. At the top left is the 360stories logo. To its right are links for "ABOUT" and "CONTACT". Below the header is a large 360-degree video player showing a scene from Krakow, Poland. The video player interface includes a play button, a progress bar, and a zoom control. Below the video, the text "Video panorama of Krakow (Poland)" is visible. Underneath the video player is a section titled "KRAKOW (POLAND)" with a red "+ more info" button. Further down the page is a section titled "360 TRIPS" featuring a thumbnail for "DARTMOOR NAT. PARK". Below this is a section titled "KRAKOW - IMMERSIVE ENVIRONMENTS" containing six thumbnails: "KRAKOW (POLAND)", "KRAKOW (360° SCREEN)", "KRAKOW - ICC360", "KRAKOW (DOME - HKONG)", "KRAKOW (DOME SCREEN)", and "KRAKOW (MONTREAL)".

<http://www.360stories.net>

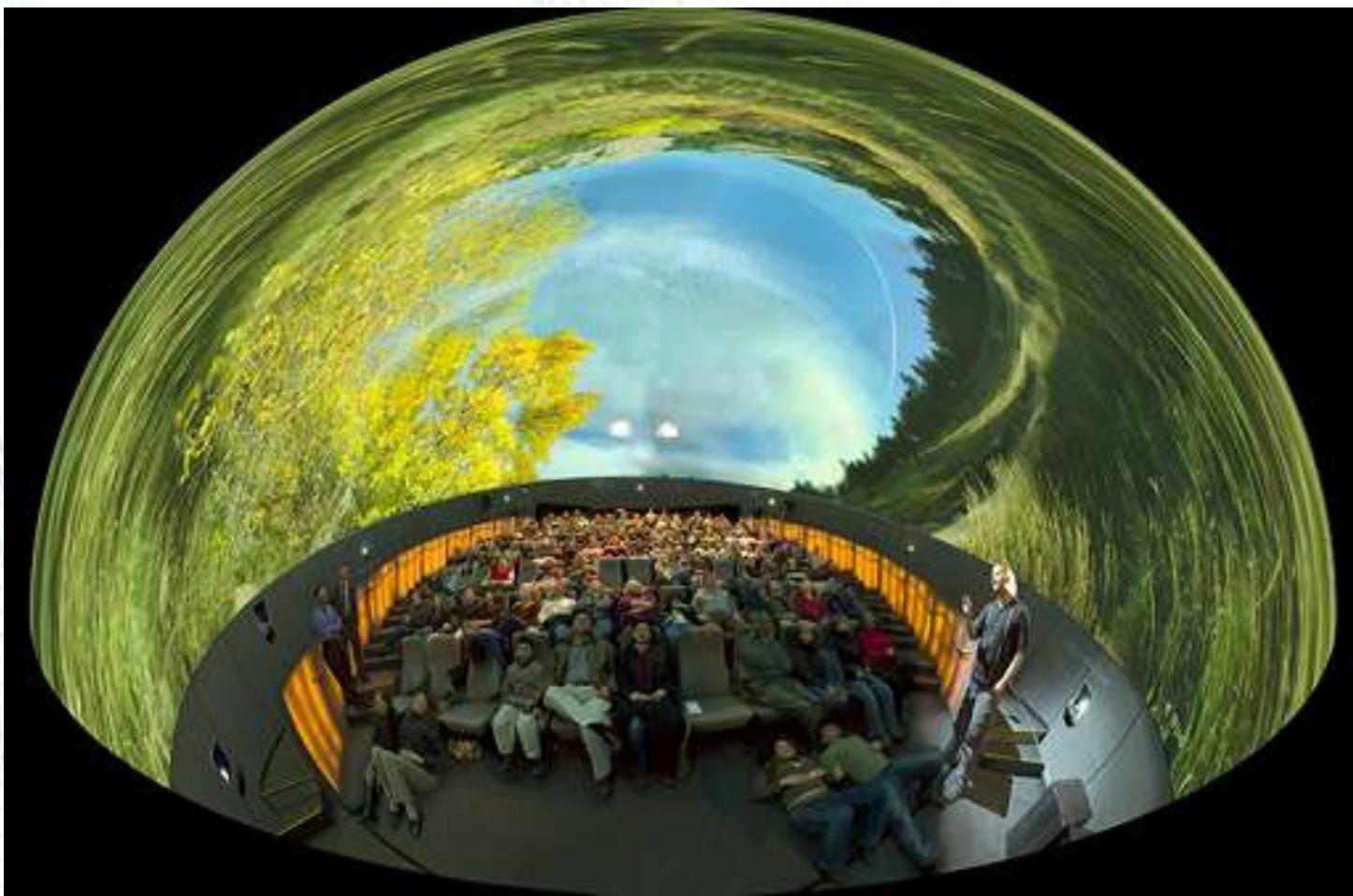
Tablet computer



iDome screen



Planetarium



450

Panoramic projection systems



Projectors

6. Przykłady interaktywnych filmów 360°

Kościół Karola w Plymouth

Charles Causley

Film 360°

CHARLES CHURCH
PLYMOUTH, UK
PHD RESEARCH PROJECT



0 50 100 150 200 250 300 350 400 450

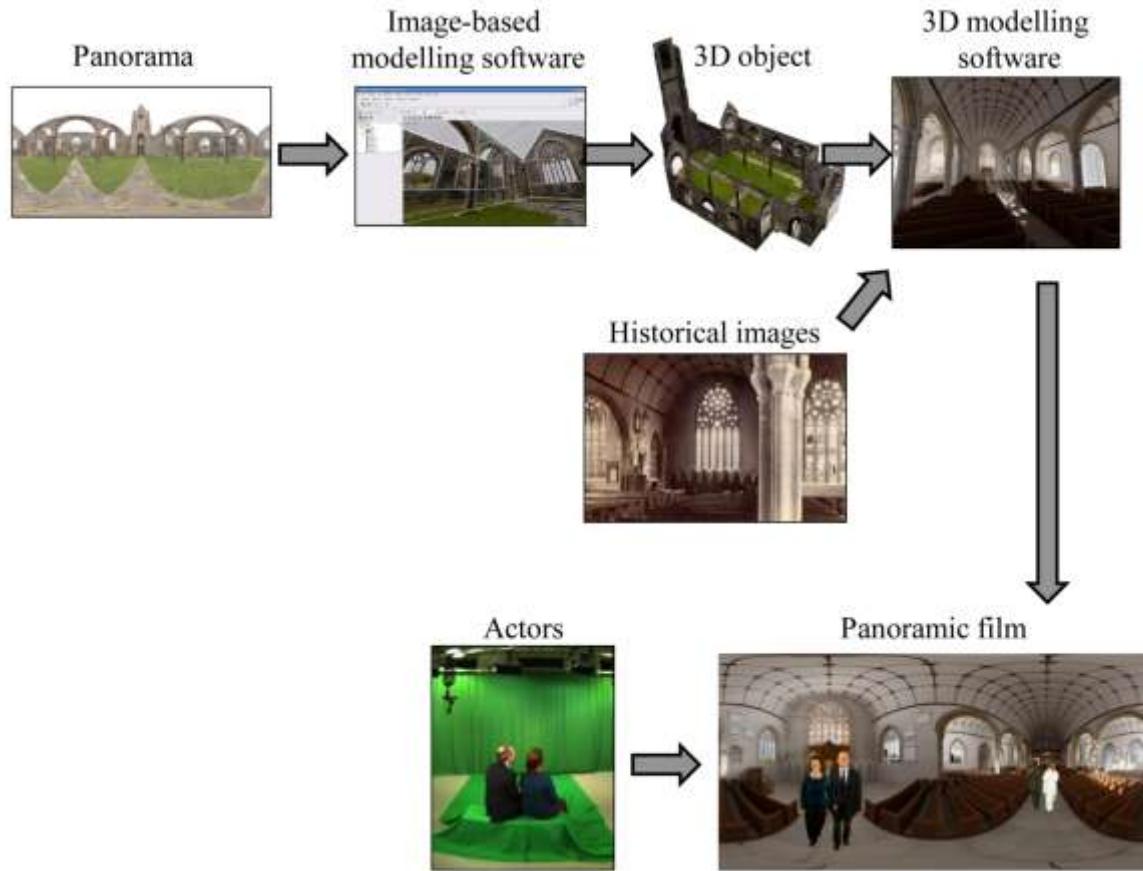
Kościół Karola w Plymouth (Wielka Brytania)



Zbombardowany w 21/22 marca 1941

- Umiejscowiony na środku ronda
- Miejskie miejsce pamięci ofiar z 1941 roku

Jak stworzyłem interaktywny film 360°?



Kościół Karola

- Rekonstrukcja 3D na podstawie historycznych zdjęć



400 450

[+] [Perspective] [Smooth + Highlights + Edged Faces]

Common V-Ray Indirect illumination Settings Render Elements

A 3D wireframe model of a church interior. The scene features wooden pews arranged in rows, leading towards a altar area at the far end. Large arched windows with intricate tracery are visible on the right side. A camera rig is positioned in the lower-left foreground, consisting of a camera body mounted on a tripod with a lens attached. A red arrow points from the camera's viewfinder towards the altar. The entire model is rendered in a dark, monochromatic wireframe style.

Common	V-Ray	Environment illumination	Settings	Render Elements
<p>V-Ray:: Authorization</p> <p>About V-Ray</p> <p>V-Ray:: Frame buffer</p> <p>V-Ray:: Global switches</p> <p>V-Ray:: Image sampler (Antialiasing)</p> <p>Image sampler</p> <p>Type: Adaptive subdivision</p> <p>Antialiasing filter</p> <p><input checked="" type="checkbox"/> On Area Computes Antialiasing using a variable size area filter.</p> <p>Size: 1.5</p> <p>V-Ray:: Adaptive subdivision image sampler</p> <p>V-Ray:: Environment</p> <p>V-Ray:: Color mapping</p> <p>V-Ray:: Camera</p> <p>Camera type</p> <p>Type: Spherical</p> <p><input checked="" type="checkbox"/> Override FOV Height: 400.0 Dist: 2.0</p> <p>FOV: 360.0 <input checked="" type="checkbox"/> Auto-fit Curver: 1.0</p> <p>Depth of field</p> <p><input type="checkbox"/> On Aperture: 5.0cm Sides: 5</p> <p>Center bias: 0.0 Rotation: 0.0</p> <p>Focal dist: 200.0cm Anisotropy: 0.0</p> <p><input type="checkbox"/> Get from camera Subdivs: 6</p> <p>Motion blur</p> <p><input type="checkbox"/> On Duration (frames): 1.0 Prepass samples: 1</p> <p>Interval center: 0.5 Blur particles as mesh</p> <p>Bias: 0.0 Geometry samples: 2</p> <p>Subdivs: 5</p>				
<p>Preset: <input style="width: 100px; height: 20px; border: 1px solid black; border-radius: 5px; padding: 2px 10px;" type="button" value="..."/></p> <p>View: Perspective <input style="width: 20px; height: 20px; border: 1px solid black; border-radius: 5px; padding: 2px 10px;" type="button" value="..."/></p>				

The screenshot shows the MotionBuilder interface. At the top, there's a toolbar with icons for selection, transformation, and playback controls. Below the toolbar is a horizontal timeline with a yellow header labeled '2000'. The timeline has numerical markers at 0, 200, 400, 600, 800, 1000, 1200, 1400, 1600, and 1800. A red vertical bar marks the current frame at 800. In the center, there's a camera view showing a scene with several objects. To the left of the camera view, the text '1 Camera Selected' is displayed. On the right side of the camera view, there are input fields for X, Y, and Z coordinates, each with a corresponding numerical input box and a lock icon. To the far right, a text box shows 'Grid = 10.0cm'. Below the camera view, a message says 'Click or click-and-drag to select objects'. At the bottom of the interface, there's a menu bar with options like File, Edit, View, Tools, and Help. The 'Edit' menu is currently selected, indicated by a blue background.

A screenshot of the Motion panel in Adobe After Effects. The top section shows a vertical timeline with a single keyframe at frame 200. Below the timeline is a toolbar with various controls. The 'Auto Key' dropdown menu is open, showing 'Selected' as the current option, with other choices like 'All' and 'None' available. To the right of the dropdown are playback controls (rewind, play, fast forward, stop) and a zoom tool. At the bottom of the toolbar are buttons for 'Set Key' (with a key icon), 'Key Filters...', and a numeric input field set to '179'. There are also small icons for lock, duplicate, and delete.

Rekonstrukcja ślubu z 1941 roku

- Nieliniowy film
- Chroma keying (zielony ekran)
- Nagrania kamerą sferyczną
Ladybug2

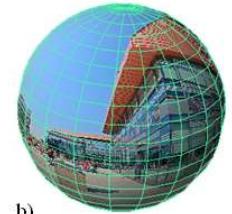


- Ken – 97 lat
- Phyllis – 91 lat
- W 2011 obchodzili 70 lecie swojego ślubu

Rekonstrukcja ślubu w historycznym kościele Karola



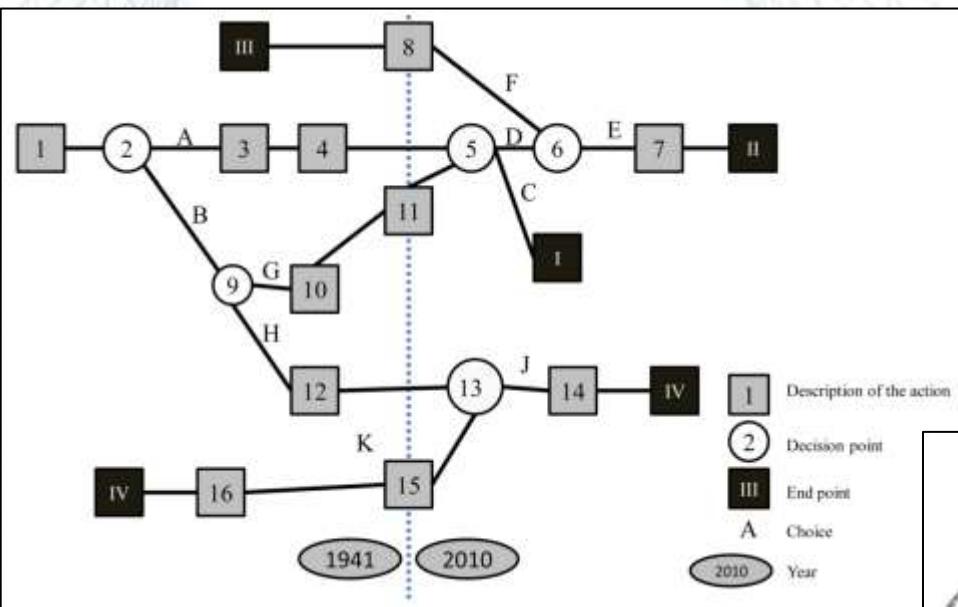
a)



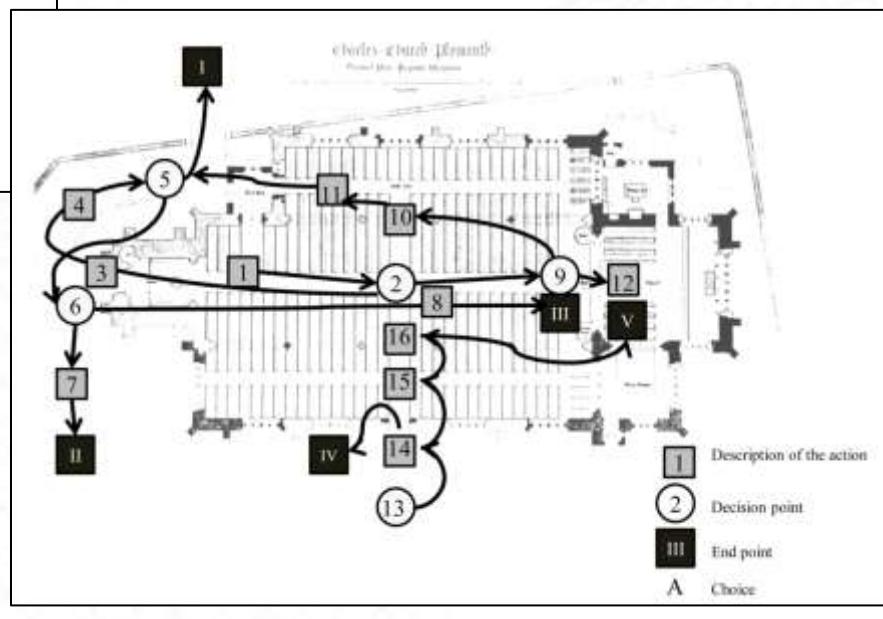
b)

0
100
200
300
400
500
600
700
800
900
1000

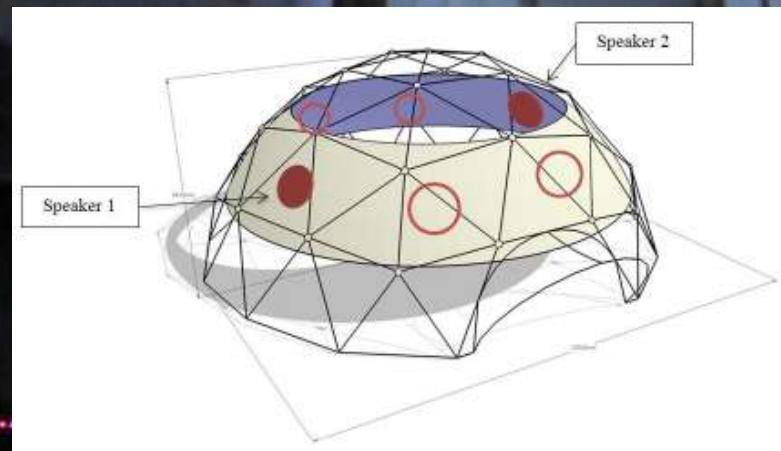
Połączenia



Jak je połączyć?



Narracja 360^{3D} na ekranie cylindrycznym

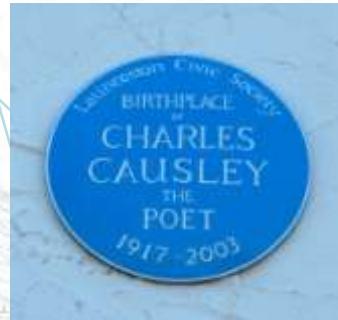


II Projekt: Charles Causley

- Cornish poet
- Spent most of his life in **Launceston**, Cornwall, UK
- was a teacher in Launceston until 1976
- wrote many **poems which were either directly**

about features of his home town of Launceston

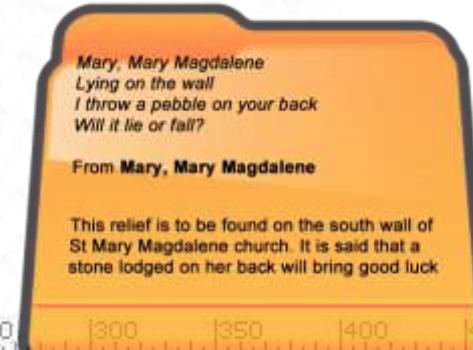
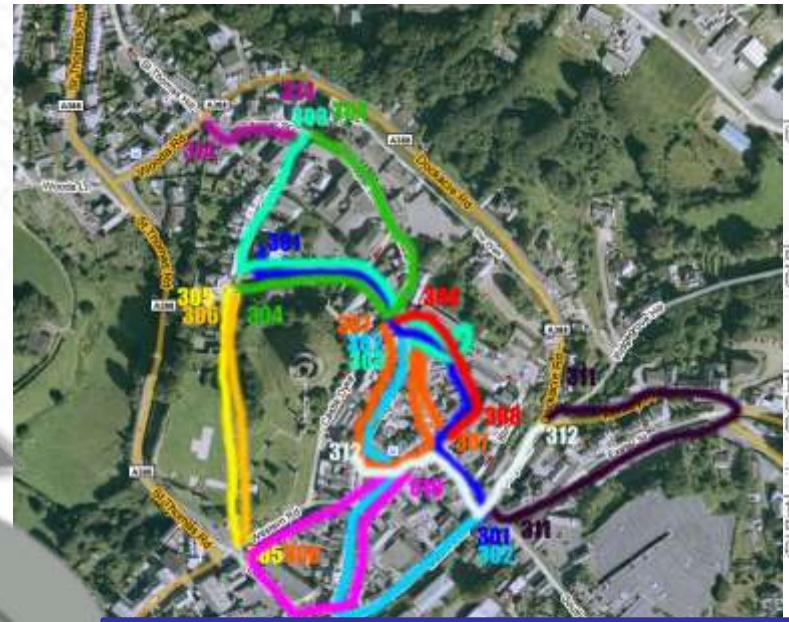
or which were set in specific locations within the town



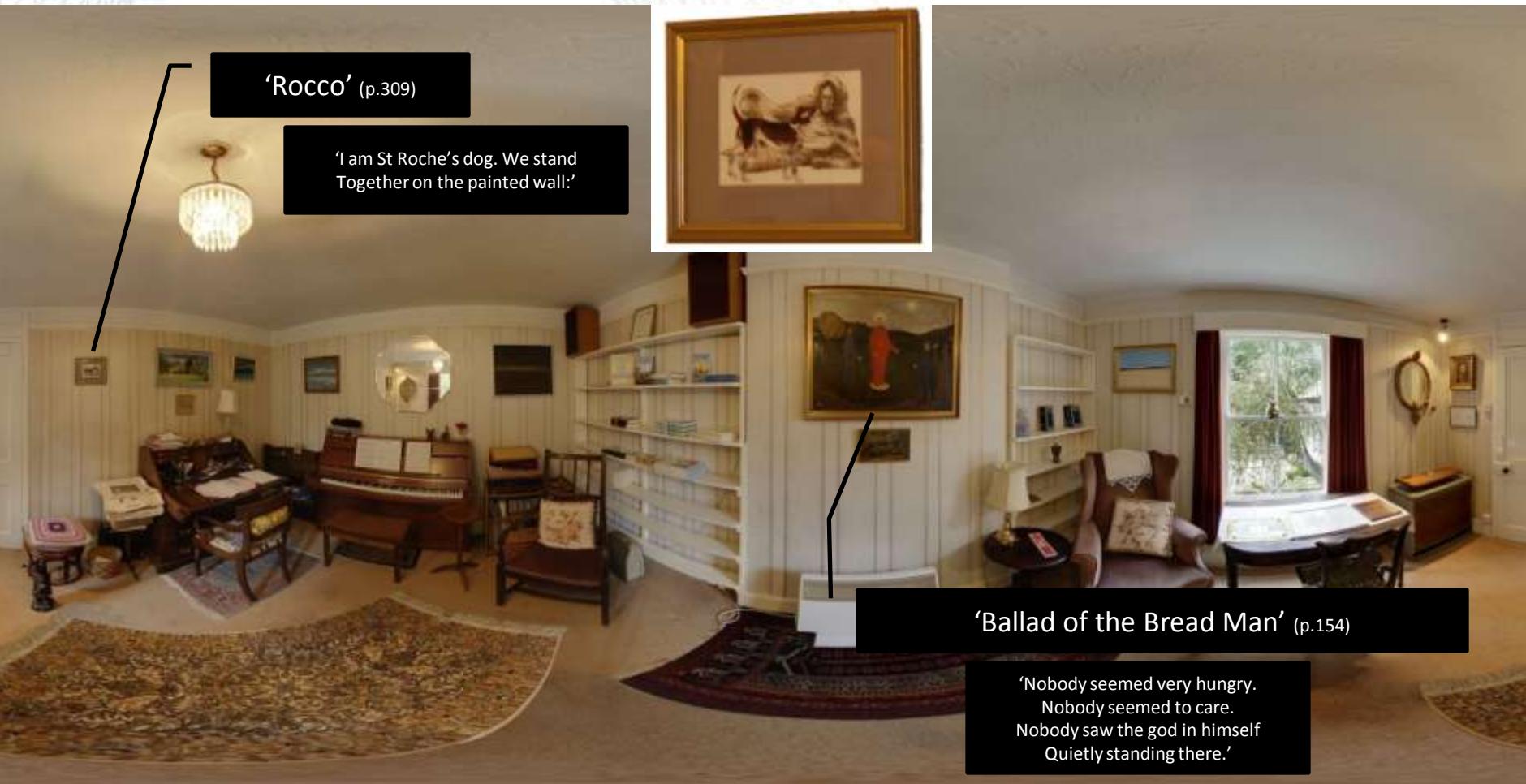
1917-2003



Interactive film



References to objects in his house



Poems



*Mary, Mary Magdalene
Lying on the wall
I throw a pebble on your back
Will it lie or fall?*



From ***Mary, Mary Magdalene***

This relief is to be found on the east wall of **St Mary Magdalene church**. It is said that a stone lodged on her back will bring good luck.

*Tom and Tim the quarter boys
On the Guildhall tower
Turn and strike the quarter-bell
Twenty times an hour.*

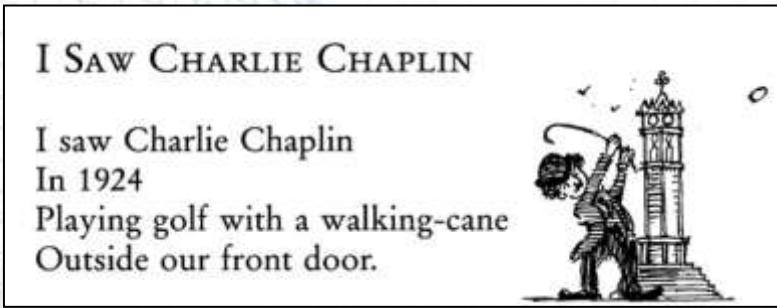
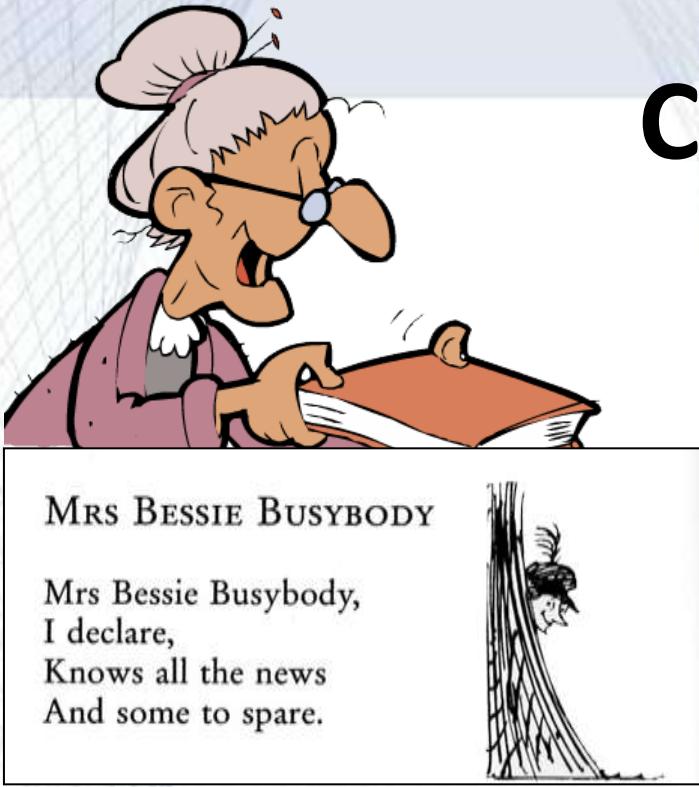


From: ***Quarter-Jacks***

These can be found on the **Guildhall** above the clock face and overlooking the castle entrance.



Characters



- Once the user meets them they provide clues about the position of the final target

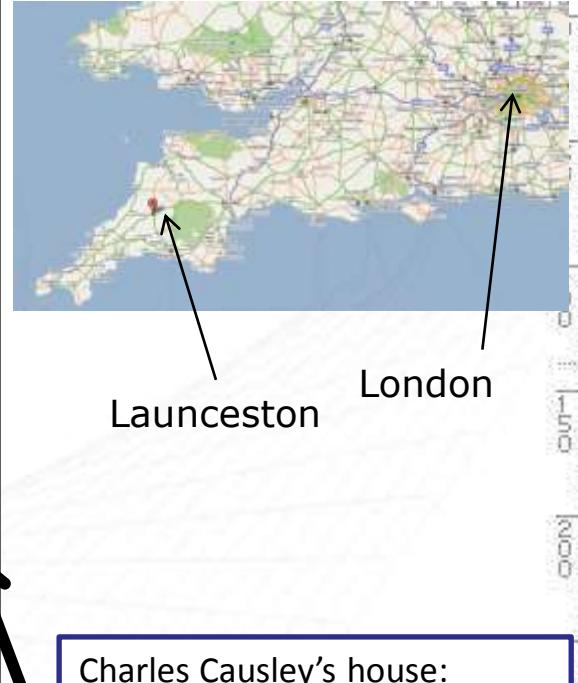
Launceston in Cornwall

Interactive storytelling
"Where is Paradise?"

Charles Causley Project

37 still panoramas
42 video panoramas

Branching narrative



Charles Causley's house:

7. Podsumowanie

- Video panoramy jako nowa forma tworzenia interaktywnych filmów
- Interaktywność widza z filmami 360° - wybór formy dokonywania wyborów
- Potrzeba stworzenia edytora do układania nieliniiowych filmów
- Formy prezentacji filmów 360° (ekran komputera, tablet, iDome, okulary VR)

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A photograph of a man with brown hair, wearing a light-colored button-down shirt and black VR goggles, looking upwards and to the right. He is positioned on the left side of the frame. In the center-right, a vintage biplane is captured in mid-flight against a blue sky with white clouds. The plane has two sets of wings and a single-seat cockpit. The background shows a green field and a line of trees under a bright sky.

Dziękuję

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