Quo Vadis Homo Turisticus?
Towards a Picture-based Tourist Profiler

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Abstract

The World Wide Web has become an important source of information for tourists planning their vacation. So, destination recommendation systems supporting users in their decision making process by suggesting suitable holiday destinations or packages based on user profiles are a vivid area of research. Considering the complex and often tedious task to obtain such profiles we are exploring a new direction to manufacture user profiles. Having in mind that a picture paints a thousand words we conducted an online survey that allows investigating the relationship between tourism-related photographs and tourist types. In a nutshell, our findings show a significant relationship between different tourist types and the preference for particular visual impressions conveyed by photographs. Thus, tourist types can be determined by representative photos without necessarily requesting users to provide additional information.

Keywords: Tourism habits; user profiles; visual preferences; destination recommendation

1 Introduction

The importance of the Internet as an influencing factor for the tourism business is marked by the steadily increasing number of online travel sales worldwide. This makes tourism the leading application in business-to-consumer e-Commerce (Werthner & Ricci, 2004). Besides this economic perspective of e-Tourism, from which users increasingly act as their own travel agents, the Internet has become much more than an additional sales channel or a platform for conducting business transactions. It is an important source of information supporting the pre-trip search as well as the decision making process of tourists.

Personalization plays an important role in such information systems, because personal preferences can be used to adapt the user's environment to her needs. Intelligent

services such as destination recommendation systems heavily rely on personal profiles for the recommendation algorithms. Destination recommendation systems support the decision making process of tourists and transcend pure information provision and exchange (Staab et al., 2002; Fesenmaier et al., 2003). The focus of recommender systems in tourism is on destination selection and offering product bundles tailored to the user's needs (Ricci & Werthner, 2002). In addition to explicitly expressed needs and constraints, a vital piece of information is the user profile. However, the process of creating such profiles can be a rather annoying, time-consuming and cumbersome task (Gretzel et al., 2004). This may result in poorly maintained user profiles reducing the quality of recommendations, and consequently, the acceptance and, thus, the success of destination recommender systems.

Vogt & Fesenmaier (1998) have proposed a model of tourists' information needs forming a categorization of different types of needs. A substantial part of this model is composed of hedonic as well as aesthetic needs. This highlights the importance of communicating emotion in the tourism business in addition to hard facts that usually answer functional and innovation needs. Gretzel & Fesenmaier (2003) argue that more than audiovisual content needs to be communicated in the future to improve tourism marketing strategies. It has been shown that sensory information such as colour, scent and sound plays an important role for tourists when imagining how a holiday destination might be. This finding is backed by Govers & Go (2004), who have analyzed text and images on Web sites related to tourism in Dubai. They draw the conclusion that the use of photographs to design effective tourism experiences is limited and more creativity is needed to effectively use the Internet for marketing purposes in the tourism business. However, besides videos, 360 degree panoramas or virtual tours, photographs still remain the most important instrument for communicating emotion on tourism Web sites.

In this paper, we present the findings of an online survey conducted to investigate whether tourist's habits can be derived from tourism-related photographs in order to facilitate the process of user profile creation. The findings will be used in the 3D e-Tourism environment "itchy feet" that we are currently developing (Berger et al., 2006). In particular, in a welcome area for newbies and first-time users, they will be able to select from an expressive set of visual impressions by simply navigating through the environment. Depending on their choices initial user profiles will be manufactured.

The remainder of the paper is structured as follows. In Section 2, we describe the questionnaire. The results and their discussion are presented in Section 3 followed by a conclusion in Section 4.

2 Questionnaire Design

The instrument of our survey was an online questionnaire that was created with the *Infovalidator* tool by MindTake (www.mindtake.com). It was made public in July 2006 on a Web portal. This questionnaire consisted of three parts whereof the first part aimed at obtaining personal and demographic data of the participants. These were age group, gender, marital status, number of children, highest level of education, and whether they live in a city or town. The second part of the questionnaire was created to capture the personal tourism habits of the participants. To this end, a set of 17 tourist types based on the work by Yiannakis & Gibson (1992) was chosen. The tourist types were described in terms of statements such as *"interested in relaxing and sunbathing in warm places with lots of sun, sand and ocean"* or *"mostly interested in meeting the local people, trying the food and speaking the language"* whereof the first description corresponds to the tourist type referred to as the *Sun Lover* and the latter to the *Anthropologist*. Note that we refrained from providing the actual labels of the tourist types presuming that participants might be biased by these. Additionally, we have defined four age groups, viz. less than 20, 21 to 40, 41 to 60, and over 60. Each participant was asked to select those tourist types which she has belonged to in earlier periods of her life, or currently belongs to. For example, a participant aged 47 was requested to select her personal tourism habits when she was younger than 20, between 21 and 40 as well as her current preferences.

The third part of the questionnaire comprised ten pages, each of which containing six photos of different tourism-related situations, i.e. a set of 60 photos. Participants were asked to identify those photos that best represent their past and present personal tourism habits. The set of photos was manually compiled with the goal in mind to provide a representative sample for each tourist type. We explicitly asked the participants to abstract from the specific situation shown on the photo and to completely disregard its aesthetics, i.e. its photographic quality.

3 Discussion of Survey Results

The survey was completed by 476 respondents in about eight minutes on average. Some of the respondents provided incomplete data resulting in the removal of 50 respondents' answers. Thus, we removed i) seven that provided no information about their past or present tourist types, ii) two that did not select any photo, iii) age group "less than 20" which just contained eight individuals and iv) 33 individuals who seemingly misunderstood the third part of the questionnaire. They restricted themselves to select exactly one photo per photo page. The demographic composition of the sample is shown in Table 1.

Table 1. Personal and demographic characteristics of survey sample (n=426).

Gender	Female - **208**; Male - **218**
Age group	21 to 40 - **200**; 41 to 60 - **187**; 61 and above – **39**
Education	Primary - **148**; Secondary - **156**; University – **122**
Marital status	Single/separated - **115**; married/living with long term partner - **311**
Kids	no kids - **189**; one or more kids – **237**
Resident of a	city - **188**; village/town – **238**

The 17 tourist types are given in Table 2. Additionally, the descriptions provided in the questionnaire as well as the absolute and relative frequencies of the respondents' current tourism habits are shown. Please note that the sum of the percentages exceeds 100%, because most respondents obviously belong to multiple tourist types. The rank order of tourist types in this table significantly correlates (Pearson's r=0.895, α=0.001) with the results presented in Gibson & Yiannakis (2002).

Table 2. Tourist types, their descriptions and distributions statistics

Tourist type	Description	Freq.	%
Anthropologist	Mostly interested in meeting the local people, trying the food and speaking the language	334	78.40
Escapist I	Enjoys taking it easy away from the stresses and pressures of home environment	320	75.12
Archaeologist	Primarily interested in archaeological sites and ruins; enjoys studying history of ancient civilizations	265	62.21
Sun Lover	Interested in relaxing and sunbathing in warm places with lots of sun, sand and ocean	263	61.74
Independent Mass Tourist I, (IMT I)	Visits regular tourist attractions but avoids packaged vacations and organized tours	223	52.35
High Class	Travels first class, stays in the best hotels, goes to shows and enjoys fine dining	207	48.59
Independent Mass Tourist II, (IMT II)	Plans own destination and hotel reservations and often plays it by ear (spontaneous)	196	46.01
Escapist II	Gets away from it all by escaping to peaceful, deserted or out of the way places	174	40.85
Organized Mass Tourist, (OMT)	Mostly interested in organized vacations, packaged tours, taking pictures/buying lots of souvenirs	163	38.26
Active Sports	Primary emphasis while on vacation is to remain active engaging in favourite sports	158	37.09
Seeker	Seeker of spiritual and/or personal knowledge to better understand self and meaning of life	136	31.92
Explorer	Prefers adventure travel, exploring out of the way places and enjoys challenge in getting there	132	30.99
Educational Tourist, (Edu-Tourist)	Participates in planned study tours and seminars to acquire new skills and knowledge	127	29.81
Jet Setter	Vacations in elite, world class resorts, goes to exclusive night clubs, and socializes with celebrities	104	24.41
Action Seeker	Mostly interested in partying, going to night clubs and meeting people for uncomplicated romantic experiences	86	20.19
Thrill Seeker	Interested in risky, exhilarating activities which provide emotional highs for the participant	61	14.32
Drifter	Drifts from place to place living a hippie-style existence	55	12.91

We evaluated the dependencies between tourist types and demographic features with a chi-squared test. The results given in Table 3 and Table 4 provide the p-values with significant entries ($\alpha=0.05$) being identified with an asterisk. In those cases the direction of the dependency is shown as well. Consider, for example, the first row in Table 3 describing the dependencies of the tourist type *Action Seeker*. This type depends on the age group, with a dominance of age group II (28% of the respondents of this age group described themselves as *Action Seekers*), over age group IV (25.6%) and age group III (10.7%). Regarding the marital status, single *Action Seekers* (28.7%) dominate those that are currently in a relationship (17%). Finally, the group of *Action Seekers* without children (27.5%) dominate those with children (14.3%). Please note that the tables show only those tourist types that are significantly depending on at least one demographic feature.

Table 3. Dependencies between tourist type, age group, marital status and children

Tourist type	Age group II: 21-40, III: 41-60, IV: > 60		Marital status S: Single, R: Relationship		Children N: No, Y: Yes	
Action Seeker	0.000*	II (28.0) > IV (25.6) > III (10.7)	0.008*	S (28.7) > R (17.0)	0.001*	N (27.5) > Y (14.3)
Drifter	0.494	-	0.094	-	0.005*	N (18.0) > Y (8.9)
Escapist I	0.000*	II (86.0) > III (67.9) > IV (53.8)	0.156	-	0.007*	N (81.5) > Y (70.0)
Escapist II	0.000*	II (49.5) > III (36.4) > IV (17.9)	0.119	-	0.081	-
Explorer	0.002*	II (39.5) > IV (25.6) > III (23.0)	0.027*	S (39.1) > R (28.0)	0.005*	N (38.1) > Y (25.3)
High Class	0.587	-	0.002*	R (53.1) > S (36.5)	0.034*	Y (53.2) > N (42.9)
IMT I	0.020*	II (59.5) > III (46.5) > IV (43.6)	0.965	-	0.115	-
IMT II	0.002*	II (55.0) > III (39.0) > IV (33.3)	0.770	-	0.018*	N (52.4) > Y (40.9)
OMT	0.008*	II (46.0) > IV (33.3) > III (31.0)	0.823	-	0.949	-
Seeker	0.007*	II (39.0) > III (27.3) > IV (17.9)	0.216	-	0.163	-
Sun Lover	0.000*	II (71.5) > III (54.0) > IV (48.7)	0.653	-	0.023*	N (67.7) > Y (57.9)
Thrill Seeker	0.001*	IV (20.5) > II (20.0) > III (7.0)	0.001*	S (23.5) > R (10.9)	0.002*	N (20.1) > Y (9.7)

Due to space restrictions in this paper, we cannot elaborate on the results given in Table 3 and Table 4 in full detail. We rather concentrate on a small number of findings. As might have been expected, the age group of the respondent plays a major role with 10 out of 17 tourist types depending significantly on the age group. Interestingly, the fact of having children shows comparable influence. For instance, the *Explorer* – the one that travels uncharted territory (we exaggerate, of course) – is most likely to be young without kids. Gender seems to influence only the *Educational Tourist* and the *Seeker*. In both cases, the number of females dominates the number of males. Finally, the degree of education just influences the *Organized Mass Tourist* in a significant way.

Table 4. Dependencies between tourist type, gender, residence and education

Tourist type	Gender differences F: Female, M: Male		Living in T: Town, C: City		Education P: Primary, S: Secondary, U: University	
Edu-Tourist	0.001*	F (36.5) > M (23.4)	0.086	-	0.658	-
High Class	0.446	-	0.009*	T (54.2) > C (41.5)	0.073	-
Jet Setter	0.239	-	0.043*	T (28.2) > C (19.7)	0.110	-
OMT	0.934	-	0.556	-	0.015*	P (46.6) > S (37.2) > U (29.5)
Seeker	0.028*	F (37.0) > M (27.1)	0.997	-	0.774	-
Sun Lover	0.360	-	0.005*	C (69.1) > T (55.9)	0.990	-

In Fig. 1 the frequency distribution of photo selections is shown. For example, 34 respondents have selected 20 photographs to illustrate their tourism habits and on average 21 photos were selected. Additionally, we performed a frequency analysis of the tourist types per respondent. The peak was five which correlates with the maximum obtained for the frequency analysis of photo selections when taking into account that we selected roughly four photographs per tourist type.
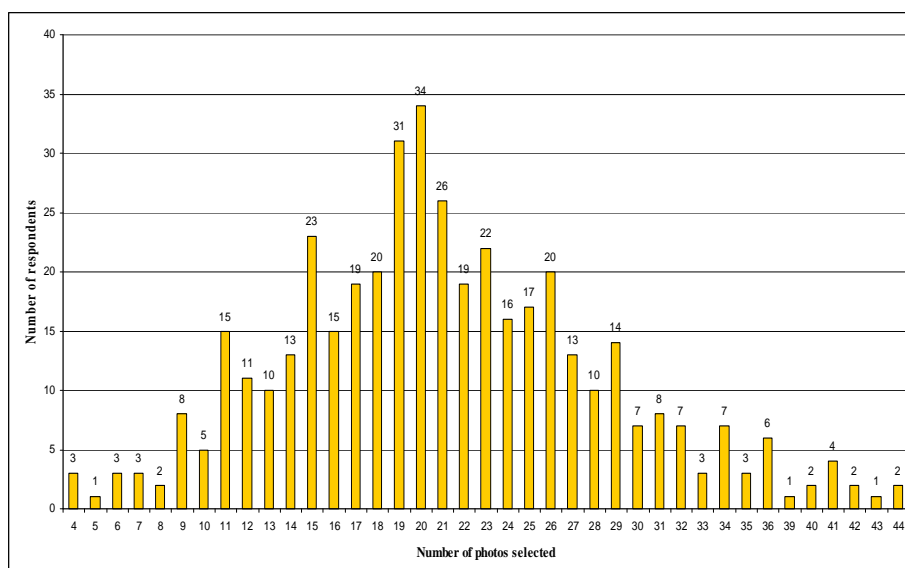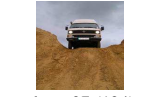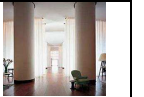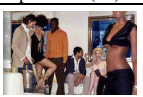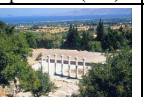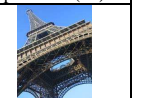
Fig. 1. Frequency distributions of photographs

A thumbnail of each photo and its corresponding frequency of selection is provided in Table 5. In this sense, the most popular photo in our survey was photo 44 (a quite alpine region) with a total of 332 selections and the least popular one was photo 30 (audience with an Indian Bhagwan) with just 11 clicks.

Table 5. Photos used in the survey; for details see http://ispaces.ec3.at/tourismsurvey/

photo 01 (147)	photo 02 (210)	photo 03 (86)	photo 04 (84)	photo 05 (75)	photo 06 (222)
photo 07 (124)	photo 08 (243)	photo 09 (155)	photo 10 (152)	photo 11 (60)	photo 12 (121)
photo 13 (296)	photo 14 (58)	photo 15 (293)	photo 16 (104)	photo 17 (104)	photo 18(119)
photo 19 (363)	photo 20 (213)	photo 21 (45)	photo 22 (133)	photo 23 (60)	photo 24 (155)
photo 25 (295)	photo 26 (301)	photo 27 (26)	photo 28 (207)	photo 29 (71)	photo 30 (11)
photo 31 (74)	photo 32 (275)	photo 33 (42)	photo 34 (268)	photo 35 (262)	photo 36 (283)
photo 37 (165)	photo 38 (163)	photo 39 (195)	photo 40 (226)	photo 41 (209)	photo 42 (138)
photo 43 (154)	photo 44 (332)	photo 45 (54)	photo 46 (110)	photo 47 (29)	photo 48 (142)
photo 49 (39)	photo 50 (299)	photo 51 (166)	photo 52 (66)	photo 53 (196)	photo 54 (53)
photo 55 (120)	photo 56 (27)	photo 57 (161)	photo 58 (62)	photo 59 (92)	photo 60 (79)

Correspondence analysis was used to produce a map of the relationships between tourist types and the photographs. Starting from a cross tabulation of photo click frequencies by tourist type, we obtained the correspondence analysis map depicted in Fig. 2. The numbers in the figure correspond to the photographs as presented in Table 5. The results show that the relationship between tourist type and photo can be mapped onto two dimensions that account for 56.44% of the inertia, i.e. a large amount of the total variance is explained by the first two principal axes. In particular, the x-axis (35.7% of the inertia) can be referred to as the *Pack Factor* and the y-axis (20.74% of the inertia) represents the *Kick Factor*. The *Pack Factor* identifies the "level of collectivity" one might associate with a particular tourist type. Consider, for example, the *Explorer*, which is the left-most tourist type, and the *Organized Mass Tourist*, the right-most tourist type along the x-axis. The *Explorer* might be identified as a rather solitary individual compared to an *Organized Mass Tourist,* who is generally accompanied by a larger number of like-minded tourists. Interestingly, this dimension corresponds to the findings of a study in which tourist experiences have been identified to vary along a continuum of individualistic/collectivistic orientation (Mehmetoglu, 2004). The *Kick Factor* identifies the "level of excitement" one might associate with a particular tourist activity. The *Thrill Seeker*, for instance, is per definition interested in risky, exhilarating activities that provide emotional highs. Contrary, the *Escapist I* enjoys taking it easy, far away from the stresses and pressures of the home environment.

The generated layout of photos is to a high degree in-line with the alignment of the tourist types. For example, photos 22 (alpine ski touring) and 37 (alpine skiing) are highly associated with *Active Sports* whereas photos 46 (whitewater rafting), 52 (sky diving), 56 (bungee jumping) and 59 (windsurfing) correspond to the *Thrill Seeker*. The *Action Seeker,* however, is represented by photos such as 3, 21 and 29 all of which are party *sujets*. The photo layout also reflects the criteria defined by each axis. For example, photo 27 shows the highest level of individualism – in fact it depicts a solitary hitch hiker. Contrary, photo 14 represents a typical packaged tour enjoyed by a group of bus tourists. In terms of the *Kick Factor*, photos 1 (car rental area in airport) and 55 (rainy; group listening to tour guide) identify a moderate level of excitement whereas photos 52 and 56 depict risky and exhilarating activities.

Interesting findings can be derived from the actual position of each particular tourist type in the map. The lower left quadrant, for example, corresponds to a high level of individualism and rather tranquil activities. As a result, this quadrant contains tourist types such as the *Anthropologist*, *Archaeologist* as well as the *Escapist I* that were quite frequently chosen by the respondents (with a total of 1,589 assignments). Note that these figures include the respondents' past and present tourist type assignments. Thus, these numbers exceed the ones given in Table 2. The rather compact arrangement of these tourist types reflects their very close relationship and explains

the difficulty to distinguish between them. The upper-left quadrant comprises the *Explorer*, *Active Sports* and *Drifter* tourist types, which show a rather high level of individualism as well as excitement. These rather specific tourist types account for 679 assignments.
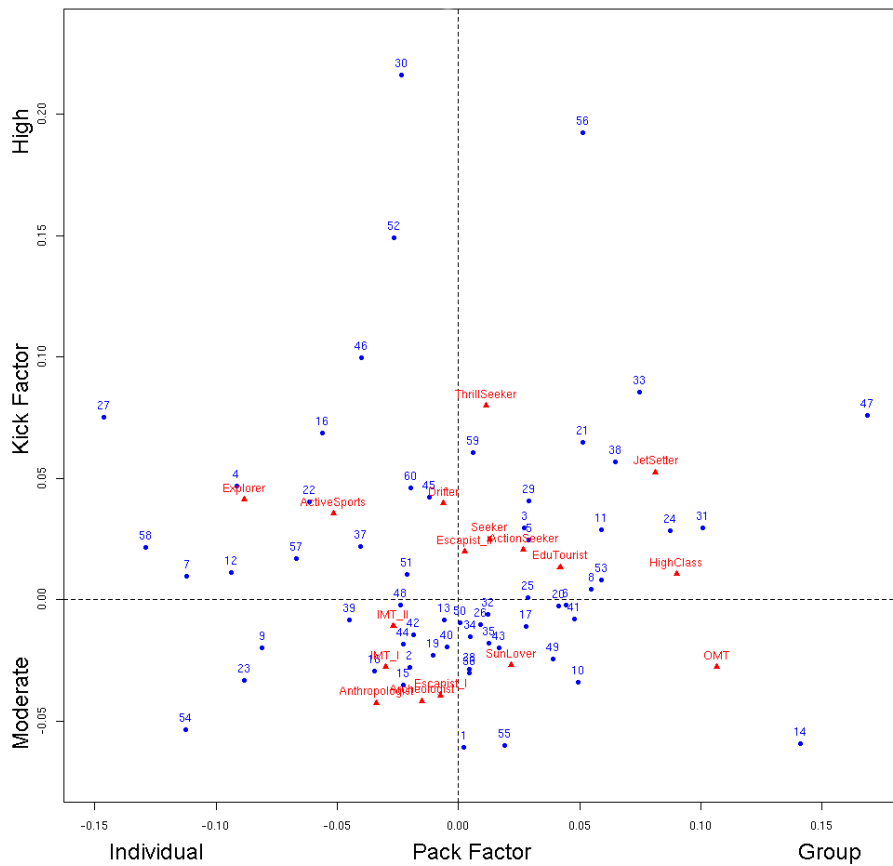
Fig. 2. Correspondence map of the relationship between tourist types and photos

A large number of tourist types can be found in the upper-right quadrant of the map comprising 1,368 assignments. The types range from the *Thrill Seeker*, over the *Jet Setter* and *High Class* to the *Action Seeker*. We may conclude that the higher the *Kick Factor* of a particular tourist type is the less frequently it is chosen. However, the differences between some of these types seem to be rather small taking their close

position in the map into account. A possible interpretation is, that for instance the *Seeker* ("… searching for spiritual and/or personal knowledge…") and the *Educational Tourist* ("… searching for new skills and knowledge…") share some common ground or are performed in a sense simultaneously. The lower-right quadrant contains two tourist types, namely the *Sun Lover* and the *Organized Mass Tourist*. With these groups this quadrant accounts for 556 assignments. The degree of individuality attributed to these two tourist types is rather low since packaged tours and all-inclusive offers can be regarded as the dominating characteristic of these tourist types. Nevertheless, there seems to be a not negligible difference in terms of individuality between the *Sun Lover* and the *Organized Mass Tourist* taking the distance of their alignment in the map into account. The *Kick Factor* associated with these tourist types is rather moderate highlighting the desire for relaxation and hassle-free tourism experiences.

The importance of individual photos to distinguish between tourist types is analyzed by means of logistic regression. In particular, the photos with positive and significant coefficients in the regression model are regarded as positive examples for a particular tourist type. Conversely, photos with negative and significant coefficients are counter examples. Following this approach, we obtain the mapping of photos to tourist types as given in Table 6. We indicate the significance levels with asterisks *** ($\alpha=0.001$) and ** ($\alpha=0.01$).

Regarding the positive examples, we obtain impressive results for characterizing the following tourist types: *Anthropologist* (photo 02 – a group of indigenous musicians), *Archaeologist* (photo 34 – the remnants of an ancient Greek temple), *Sun Lover* (photo 25 – a beach), *High Class* (photo 24 – the entrance hall of an elegant hotel; photo 31 – a posh bar), *Organized Mass Tourist* (photo 14 – group of bus tourists), *Active Sports* (photo 39 – cyclists), *Action Seeker* (photo 29 – a party), and *Thrill Seeker* (photo 46 – whitewater rafting; photo 52 – sky diving). However, we also recognized the rather unexpected phenomenon that photo 38, showing the Burj al-Arab hotel in Dubai, can be found as representative for six tourist types. Moreover, 163 participants of the survey selected this particular photo. As a first guess to explain this phenomenon, we tend to conclude that a fairly large number of participants used photo 38 as the emblem of their vacation dreams rather than their vacation practice.

Regarding the negative examples, we want to refer to photo 54 depicting a street musician. Selection of this photo significantly excludes membership to the *Archaeologist*. Photo 13, showing a tranquil scenery with boat, is a perfect example against the typical *Active Sports* tourist. We also want to mention the photographs that showed no significance, neither positive nor negative: photo 06 (devoid golf course), photo 33 (posh party), photo 35 (street café), photo 36 (the Eiffel tower), photo 41 (holiday resort with pool), photo 45 (group performing Tai Chi), photo 47 (celebrities

on red carpet), photo 55 (rainy; group listening to tour guide), and photo 58 (hippie-style Volkswagen bus). Please note that only for a small number of tourist types we were unable to identify important photos, i.e. *Seeker*, *Explorer* and *Drifter*.

Table 6. Important photos to visually represent a tourist type

Tourist type	Positive Examples	Negative Examples
Anthropologist	photo 02**	
Escapist I	photo 38**	
Archaeologist	photo 34***	photo 54***
Sun Lover	photo 25***	
IMT I	photo 02**, photo 05**	
High Class	photo 24***, photo 38***, photo 31**	photo 15**
IMT II	photo 38***, photo 39***	
Escapist II	photo 05**	
OMT	photo 14***, photo 38**	photo 15***
Active Sports	photo 39**	photo 13**
Edu-Tourist	photo 38**	
Jet Setter	photo 38**	photo 15**
Action Seeker	photo 29**	
Thrill Seeker	photo 46**, photo 52**	

4   Conclusion

In this paper, we presented the findings of an online survey conducted to investigate whether tourist's habits can be derived from tourism-related photographs in order to facilitate the process of user profile creation. The results of this survey show a significant relationship between different tourist types and the preference for particular visual impressions conveyed by photographs. For most tourist types, we have determined representative photos, which, in turn, allow the assignment of tourist types to persons based on their selection of a set of photos. Considering the relationship of tourist types and tourist activities stated by Gretzel et al. (2004), we arrive at a mapping between tourism-related photographs and tourist activities. It is now possible to make the traditional process of registration and profile generation more fun by letting the user select from a couple of photos that reflect her tourism habits, and then infer her according tourist types.

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