

Daisy-Chaining & Berry-Picking: Trajectory Oriented Design for Mobile Guides in the Wild

Nicola J Bidwell

School of IT, James Cook University, Australia

nic@it.jcu.edu.au

Connor Graham

Dept. of IS, University of Melbourne, Australia

cgraham@unimelb.edu.au

ABSTRACT

A trajectory perspective can assist designing a mobile guide for visitors “in the wild” by enabling description of the multi-faceted mosaic of information situated in momentary and cumulative wayfinding experiences. Temporal patterns in people’s acquisition and use of information in the terrain emerged in wayfinding field experiments and enabled composing two metaphors referring to linear and non-linear relations. We describe use of the metaphors to interpret diverse data about informational and affective aspects of wayfinding in the Wet Tropics World Heritage Area.

Categories and Subject Descriptors

H.5 INFORMATION INTERFACES AND PRESENTATION (e.g. HCI) H.5.3 User Interfaces H.5.3 Group and Organisation Interfaces: <http://www.acm.org/class/1998/>

General Terms

Design, Experimentation, Human Factors, Theory,

Keywords

Navigation, landmarks, wayfinding, field study.

1. INTRODUCTION

We present an approach to designing mobile guides that are compatible with people’s “natural” and joyful acquisition and use of information in the environment for wayfinding. Wayfinding is rarely the primary goal of an activity but subserves, and is contextualized by, other activities. Technologies integrated into these other activities, such as short message service (SMS) to co-ordinate meeting friends [1] or cameras when sightseeing, present opportunities for functionality to assist wayfinding. However, it is often difficult to garner details of their couplings with acquiring and using information in the terrain to wayfind. For example, how does a person’s momentary interaction with a signpost build on prior experience and augment technology use in collaborative rendezvous? In applying trajectories [2] to wayfinding we appreciate that “Strauss’s theory provides a rich account for temporality in action [but that] spatiality does not seem to have received quite the same attention” [3:136]. Thus, we aim to use insight from the particular spatiality and embeddedness of wayfinding in enriching Strauss’s view of trajectory to describe and account for activities that involve traversal of physical space.

In pursuing requirements for assistive devices we are developing a approach to describe people’s interactions with natural terrain in ‘wild’ environments. Our approach, derived from data presented previously with different emphases [4, 5], is sensitized to “...a

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course of action...” that “embraces the interaction of multiple actors and contingencies that may be unanticipated and not entirely manageable” [2:53]. This notion of “trajectory” assists in generating descriptions of patterns in the acquisition and use of information as people wayfind in the terrain from their perspective. Such patterns may potentially assist designers in accessing people’s fleeting, momentary experience and understanding their cumulative impact in ongoing experiences. We discuss two cases motivating adopting a trajectory perspective to explore these patterns. These illustrate relations between pre- and post- situated and situated experience emerging through field experiments. We derive two metaphors from this data to portray patterns in people’s information acquisition and use that are linear (e.g. when planning navigation and communicating wayfinding information) and non-linear (e.g. when accumulating information related to wayfinding). We conclude by introducing our use of the metaphors to interpret diverse data captured in the Wet Tropics World Heritage Area. We intend to respond to the informational and affective aspects of experiences in designing a guide for visitors “in the wild” that will support wayfinding and implicitly augment the pleasure of the activity the wayfinding subserves

2. TRAJECTORY VIEW OF LANDMARKS

Wayfinding encompasses couplings between unfamiliar and/or familiar physical environments, perceptions, conceptions and bodily movements. The roles of landmarks in these couplings, shown behaviourally, phenomenally and cognitively [6,7,8], are an anchor for embodied exploration of wayfinding. Landmarks are used when people learn, apply and describe both routes between places [9,10] and high-level concepts allied with wayfinding (e.g. selecting where to dine [11]). Interactions with landmarks carry meanings concurrently contextualized and re-contextualised in systems of meaning which, reciprocally, shape a landmark’s salience for different aspects of wayfinding. For example, the recipient of guidance “turn left at the local shop” draws upon their own experiences and interpretations of their informer’s experience of shops to distinguish the landmark; and, invests the physical shop with a role in a particular route and, perhaps, some functional association with the informer. Meanwhile, the shop generates other meanings (e.g. spatial and social properties of the locality’s amenities) which may be significant for wayfinding later. A singularly task-centric approach to navigation guidance parsimoniously, linearises information experienced in the world. Indeed, this is an inherent artifact in wayfinding communication, where route descriptions, linearising landmarks in time, or maps, linearising landmarks in space, subsume temporally evolving information patterns. These means-end abstractions “*miss what was: the act itself of passing by*”... “*only a relic set in the nowhen of a surface of projection. Itself visible, it has the effect of making invisible the operation that made it possible*” [12:97]. We posit that, by embracing continuous and contingent readjustment of action [2], analysis sensitized to trajectory can address complex couplings between people and landmarks in situ. We support this

with themes illustrating effects of cumulative wayfinding experiences on people's momentary interactions with landmarks.

2.1 Field Experiments in Wayfinding

In two field experiments we probed and depicted spatial couplings between people and unfamiliar terrain. We sought to shift from a sole focus on interactions of artifacts (e.g. guides, maps) with wayfinding and the terrain to encompass analysis of interactions between activity and the terrain. To do so we captured visual and verbal descriptions of landmarks created, communicated and used *in situ* in two distinct wayfinding activities.

In Pilots and Orienteers (P&O) [5], 4 pilots asynchronously communicated their egocentric Point of View (POV) of terrain photographically to guide 4 orienteers. Pilots constructed a sequence of 10 images of landmarks along their choice of route to one of 4 targets in a small university campus based on their own recent wayfinding. Four orienteers subsequently used an image-set to reach a target (for example, Figure 1 shows the images and paths taken by one pilot- orienteer pair). In Territory is the Map (TiM) [4] 3 wayfinders (A, B, C) starting from separate undisclosed locations, used SMS to collaborate to rendezvous at an unfamiliar place, a small park. They traversed unfamiliar roads and paths across 8km² of the central business district (CBD) and two suburbs in a small bush city, as shown in Figure 2. They were guided only by our brief description of the target's appearance, but not location; their interactions with the terrain; and, interactions with each other exclusively by SMS. Thus interactions in the studies were constrained only by the material nature of photographs, sequenced in folders, or SMS flow and the customized Nokia 3650 mobile phone interface.

We captured detailed spatio-temporal and self-reported or observed data about the environment and actions in situ and post-activity reflective data. Thematic clusters of all images or all SMSs as wayfinding incidents identified landmarks' visual, semantic and locational characteristics. These encompassed information pilots/SMS senders intended to convey (e.g. heading) and orienteers/SMS recipients used (e.g. guiding orientation). Participants' rationales for selecting/responding to landmarks were overt reflections on affordances for wayfinding. Meticulous image/SMS content analysis and comparing information

recipients used effectively with that related to breakdowns was insightful of "thrown" [e.g. 13] (reflexive, assumed) interactions..

2.2 Emergent & Evolving Wayfinding

Interactions were tightly coupled and evolved temporally with the activities and terrain. In TiM wayfinders' behaviour and SMS content were interactions with landmarks facilitating discovering the target's location and rendezvous. This "arc of action" [2] represents the researchers' "concept for the cumulative action and interaction that has taken place" [2:56]. It describes wayfinders' SMS and actions and interactions among these over the course of their wayfinding trajectory which we analysed spatio-temporally and compositionally [5]. Across this arc of action a set of 5 chronological "phases" emerged hermeneutically from analyses of "the phenomenon" of wayfinding activity involving the use of landmarks. This description has a character of "trajectory phasing" as it was conceptualised as "changes in the interaction occurring over time "around" the phenomenon as it evolves." [2:54]. Phasing for each of the 3 wayfinders in TiM is represented in Figure 2. Initially, the majority of SMSs were to **Localise Others** by referring to what wayfinders could see, or knew about, their respective starting locations. Then wayfinders undertook **Primed Rendezvous** by each heading to the unanimously familiar, water tower. From the water tower they then dispersed in **Naïve Search for the Target**, heading towards different promising areas that they already knew existed and to explore unknown areas on the way. When one wayfinder found the target he first started to **Localise Target** by describing its location to the other wayfinders. As this was unsuccessful, the final SMSs described specific **Routes to Target**.

The final phase in TiM exhibited similar couplings between the activity and the terrain as occurred in P&O. For route following recipients of SMS, and orienteers in P&O, needed to locate the landmarks in SMS/images and use this to guide them to the targets. We conceive an "arc of action" for P&O as pilots reconciling information in the terrain with **route following** they intended for orienteers; and, orienteers reconciling information in images with their past and current experiences in the terrain. Thus, in both studies arcs of action involve momentary interactions with landmarks contextualised by cumulative individual and collective experience.



Figure 1. Images in a sequence taken by a pilot and subsequent use by an orienteer (see key)

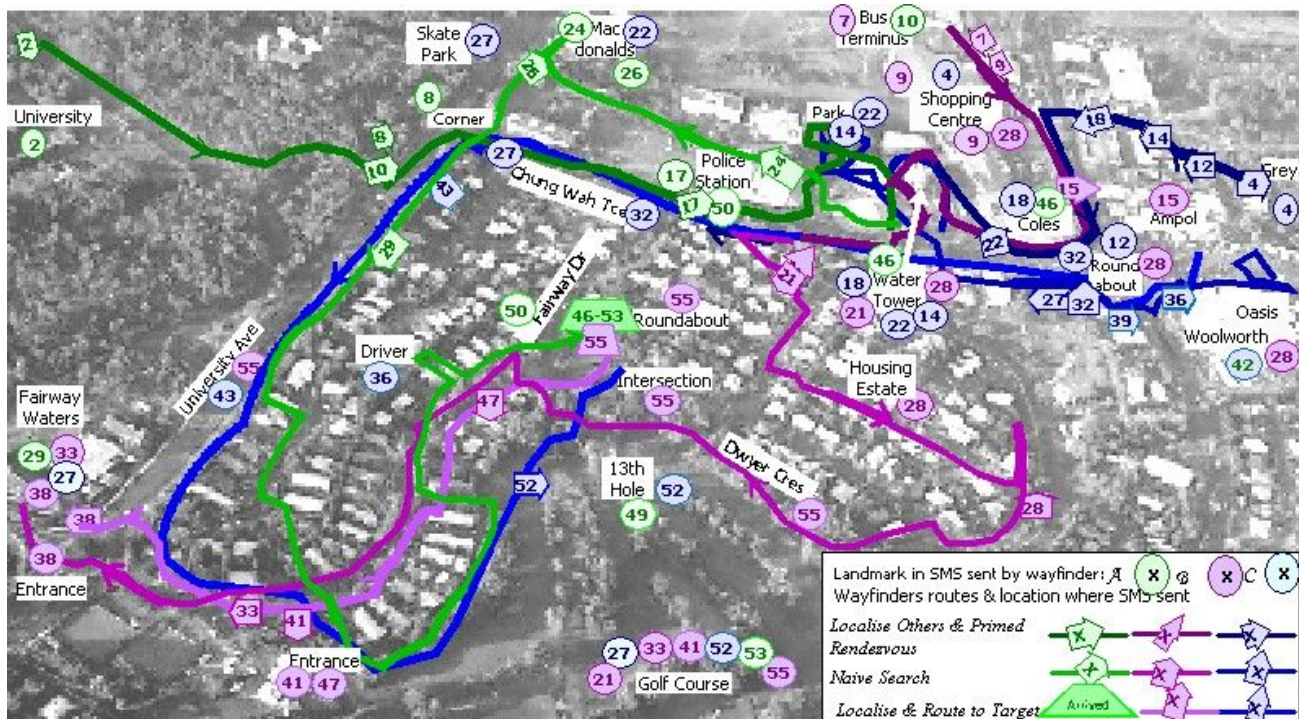


Figure 2. Location of landmarks (circles) mentioned in SMSs sent by wayfinders at locations (arrows) en route

2.3 Effects of Experience on Landmark Use

2.3.1 Shared Projections for Wayfinding Concepts

In TiM associations with the target provoked searching such as traversing a housing estate because, “single mothers need parks”; and, in P&O an orienteer sought a café when he identified dining furniture in an image. Thus, semantics associated with landmarks holistically contextualised wayfinding. Such couplings reflect wayfinders’ and orienteers’ “trajectory projections” for wayfinding to their targets. A projection is a ‘vision of the expected course of interaction perceived as needed to shape action’ [2:55].

Wayfinders described landmarks to express wayfinding contexts without explicating locations or route directions when co-ordinating rendezvous at a central place and searching for the target. Orienteers, on the other hand, used contextualizing landmarks in images as a crude configuration to localize themselves and were reassured they were heading in the correct direction by distal landmarks. Thus, wayfinders or pilot-orienteer pairs appeared to draw on semantic associations to interpret each others’ projections at a high level in mapping their own actions to representations. These operated at coarse spatial scales.

Holistic wayfinding contexts tended to be associated with landmarks described from an allocentric Frame Of Reference (FOR). A FOR is a co-ordinate system which spatially relates objects and components and is specified by its origin, orientation and relations between its axes. Allocentric FORs are relative to an object’s spatial relations (e.g. “Inside Fairway Waters”). In narratives of spatial layout people tend to use allocentric FORs to interrelate objects at larger scales (e.g. buildings in towns) [14]. Evidence also suggests that allocentric structures more acutely associate with abstract reasoning than egocentric structures [15]. For example, wayfinders’ conception of their spatial distribution as a group was a component of their reasoning about the target’s

location and was expressed using inexact, allocentric FORs. At their starting locations and when searching for the target they described landmarks allocentrically and with low locational specificity; yet, they found, “visualizing where other people are is easy”. This corresponds with using ambiguous landmark locations to conceive remote player position in location-based games [16].

2.3.2 Schemes for Routes

Subjectively translating a vague shared projection into individual actions introduces divergence. The coarse semantics and imprecise landmark locations which enabled sharing abstract contexts inadequately conveyed detailed directional information about headings. Both orienteers and SMS recipients sought more explicit landmark affordances to guide routes to a target. For example, in TiM, allocentric FORs and locational uncertainty often provoked misinterpretation or requests for explication; and interpretative differences between pilot-orienteer pairs in P&O, evidenced by different vocabulary in describing the same landmarks, constrained orienteers’ use of the image-sequences.

In TiM, SMS recipients most effectively understood directions associating landmarks with egocentric FORs, which related landmarks to the sender’s own, egocentric, POV (e.g. “The first left before the golf course”). Egocentric structures are thought to more strongly associate with actions than abstract reasoning [15] and correspond more closely with physical space than allocentric structures [14]. Orienteers sought explicit indications of a landmark to walk towards and were frequently uncertain which feature in an image the pilot intended them to focus upon or focused upon unintended features. Route guidance is most effective when landmarks proximal to a route [17] are related to prescriptive actions [18]. Orienteers assumed that the POV of the image coincided with the direction the pilot intended them to travel, were confused when presented with alternative paths (e.g. junctions) and did not perceive intentions to communicate that they should pass-by a landmark. While, orienteers tended to focus

on and travel to landmarks positioned centrally in images, particularly horizontally, the distinctiveness of landmarks did not inevitably correspond with their position in image. Sometimes they interpreted placement of certain landmarks in images as other headings, for example a de-centred dominant feature often conveyed to orienteers that they should walk around it and stairs tended to indicate travel up it. This suggests orienteers responded to landmarks they perceived as physically affording movement. In TiM, SMS recipients most accurately understood route directions when they had direct experience of the landmark relative to that route. This may imply that a landmark's efficacy as a cue en route is relative to subjective functional associations of it with a route.

A landmark's role in wayfinding, such as in a route, is inured by an individual's "trajectory scheme[s]". Such schemes are plans that are "consciously designed to shape interaction as desired, given the content of a trajectory projection" [2:55]. A landmark's salience, (e.g. its visual characteristics, semantics or relative location, within a route) reflects translating scheme(s) into actions and suggests embedding schemes "in-the-world" via landmarks. Dichotomies between individual schemes mediated guidance to the target. Wayfinders and orienteers needed to revise and re-contextualize their schemes in response to interpreting other wayfinders' or pilot's schemes. This characterization may help designers to acknowledge the multiple possible contextualisations in schemes [2] for wayfinding.

2.3.3 Schemes to Recall & Describe Landmarks

Differences between situated, retrospective and recounted schemes are indicative of discrepancies in landmark salience and legibility when it is translated into action. Schemes for recalling and recounting landmarks are reminiscent of the "pragmatics of forgetting" [12] which streamlines from those very things enlivening a journey in situ. Qualitative differences arose between landmark saliency for *recall* in post-activity narratives and for wayfinding *in situ*. Further, indexical issues arose when verbally describing landmarks that are not functionally or visually unique.

Functionally significant features are prioritized for learning [18] and confer distinctiveness to landmarks. In TiM coarser semantic concepts frequently referred to buildings in the CBD which tended to be visible or signposted from main arterial roads. Such landmarks were often "nodes" or places that pivot travel to meet-up or undertake activities [6] and "districts" or larger areas with semantic identities [6]. Wayfinders described nodes (e.g. "shopping centre") or districts (e.g. "golf course") by function but used names when nodes (e.g. the shop "Woolworths") or districts (e.g. the suburb of "Driver") lacked functional uniqueness.

Salience for using route directions in situ appears to correlate more strongly with landmarks' appearance than those generated from memory [10, 19]. The types of landmarks determined in P&O were more similar in *Route to Target* in TiM. The majority of images in P&O contained "path(s)" [6] and, when guiding others to the target, wayfinders in TiM checked road names in the vicinity and referred to these "paths" to increase locational specificity. Yet, when retracing their own steps wayfinders were unaware of road names, saying "I don't remember road names well [but] I easily remembered where I had come from". The target in TiM was located in a relatively homogeneous suburb and, on an early Saturday afternoon, nodes of human activity were inconspicuous in contrast to the more functionally distinctive CBD. Similarly, nodes were indistinct in P&O which occurred during recess in a small campus which cohesively blends modern and heritage architecture. However, approximately half of the

images conveyed banal, proximal landmarks (e.g. lamp-posts, bushes) which were distinguishable from each other without functional or visual uniqueness. Thus, the legibility of landmark exceeds verbally enumerable visual context and it appears that landmarks that are prioritized for learning or recall [e.g. 19] are not necessarily the most legible en route in unfamiliar terrain.

2.3.4 Inducing FORs to Localise Self

Cumulative effects of past on current interactions is evidenced even for the most primary level of abstraction when people use landmarks to localise themselves. Recognising landmarks depends on orientation as people first encode objects using egocentric FORs and these depend on their orientation during exposure [20]. This may explain tourists' better recognition of a destination when viewing its landmarks from the direction of their first encounter [21] and anecdotes that they do not realize they have reached a landmark if they are familiar with an iconic image of it from another angle. To localise themselves orienteers sought to re-orientate to align with an image's POV by testing the literal match between image and terrain. Their recognition of landmarks in the terrain depended on inducing FORs from the images by rotating and relocating the pilot's position and/or POV represented in the image. Orienteers more easily recognized landmarks that were proximal or familiar or predictably-shaped or free-standing or surrounded by open space. They occasionally used foreground features as cues to guide orientation or aligned repeating features. They felt less confident of their direction for images containing landmarks that were not freestanding or proximal cues that were small, natural or unusual. Observers experienced similar effects on identifying features when reconstructing wayfinders' routes in TiM from images even though they had taken the photos.

Over time people encode allocentric (object centred) FORs which originate from egocentric FORs and enable recognizing landmarks from any orientation. For example, "at the front of" is relative to a landmarks' known spatial relations and depends on the extent of a person's orientations during their prior exposure [20]. In TiM, egocentric POVs induced from allocentric FORs of landmarks affected recognition. Allocentric knowledge may derive from spatial relations holding on a class of landmarks. For example, one wayfinder correctly induced egocentric POVs for several landmarks on the golf course even though he had not seen all of them. The high frequency of references to the golf course across TiM suggest wayfinders' had encoded it allocentrically and with functional significance. Without such robust knowledge induction was error prone, for example, one wayfinder walked in view without noticing the target as the "park features" he sought to recognize it were obscured from his view. The first wayfinder to reach the target noticed it when he saw another feature matching the description and he used this experience to guide the wayfinder who had missed the target earlier. It takes substantial experience to generate "survey" knowledge to use with absolute directions and difficulties arise when people transpose POV or report their position using co-ordinates lying outside of the world [e.g. 16, 22]. Wayfinders were uncertain in relating locations to absolute directions: only one SMS used extrinsic FOR (e.g. "SSE") which was induced from experience and was incorrect.

2.4 Two Metaphors for Trajectory

Our data illustrates shaping of landmark use in wayfinding by cumulative experience at different abstractions. It suggests wayfinding schemes, determining landmark legibility and saliency, differ in situ and retrospectively and, between individuals and collectively. A trajectory perspective implies a

scheme is “deliberate” and within its envisionser’s consciousness when encountering a situation’s particulars [2]. Applied to wayfinding this suggests a scheme conditions seeking landmarks but insufficiently accounts for shaping of a scheme by encounters with landmarks. To further expand applying a trajectory approach we sought to clarify space as “a resource that is needed by actors to carry out their work” [3:137] and integrate relations between schemes and acquiring information during momentary experience. We conjectured that a mobile guide might need to support a mosaic of deliberate information seeking and serendipitous information discovery. Thus, we composed two metaphors, “daisy-chaining” and “berry-picking”, describing different possible attributes of trajectory to explore couplings between information gathering and wayfinding schemes. We used the TiM data set as it more directly accessed collectivity in action, relations between actions and landmark affordances, and whether or not landmarks were currently in sight.

2.4.1 Daisy Chaining

The metaphor of threading daisies together concerns experiences yielding a coherent planned or recalled sequence of information items salient to a route. SMS and situated actions suggested wayfinders chained information items linearly according to global or immanent projections by selecting daisies purposively and omitting spatial context tangential to the projection. At a meta-level the pattern of spatial concepts and interactions in a daisy chain expresses a navigation task but is more contingent than task-oriented plans. Structurally, a daisy-chain’s pattern reflects dependencies between consecutive daisies, or cause and affect relations, and these represent interaction between schemes for acquiring and using landmarks. The resemblance of daisy chains to organically emerging trajectories enables describing relations between ends and means across courses of action.

The wayfinders shared projection, which provided a holistic context for wayfinding, was always linked to physical landmarks. For example, their projection in identifying the target’s location was linked to purposeful destinations associated with places where children might be. However, their lack of familiarity with the area was limiting and individual wayfinder’s schemes associated with similar projections differed. Some schemes for acquiring information favour explicit purpose. Possibly, wayfinder *C* moved most slowly and with less deviation as he had better familiarity and sought to limit his time en route by *a priori* route creation [23]. However a scheme may equally have banal causes, *A*, paused little “on the principle of moving as quickly as possible ... to see other features” but as he was the only wayfinder wearing a hat in a tropical climate he also sought shade less often.

Wayfinder’s daisy-chains reflect different dependencies in acquiring and using information. Differences effected wayfinders inducing the target’s appearance from its description (see: 2.3.4) and was evident in their projection in heading to the watertower. *C* projected that a park, near the watertower, was the target; *A* projected the target would be equidistant between their starting positions and this coincided with the watertower’s location; while, *B* interpreted the SMS exchanges as simply a plan to meet up by the watertower. Conflicts between wayfinders’ schemes mediated success in guiding others to the target (see: 2.3.2). *C* disregarded *A*’s initial instructions to guide him to the target which he found difficult to understand relative to his position and adhered to a scheme he constructed via an earlier mentioned landmark.

2.4.2 Berry Picking

Simultaneous to acquiring information salient to their purposeful routes wayfinders’ actions were coupled with information that arose tangentially. A myriad of such shards of spatial context will have arisen in wayfinder’s momentary experiences. The metaphor of berry-picking indicates harvesting information from these experiences as plucking berries from bushes here and there, reactively and concomitantly, without observable linearity. Serendipitous information influenced an immanent projection to ascertain starting locations and hypothesise the target’s location. *A* started at a bus stop and wondered whether all wayfinders’ were starting at bus stops and were they allowed to travel by bus. Ten minutes later *B*, described his starting location as “at a bustop”. Coincidentally, *B*’s SMS arrived when *A* sat in front of a sign: “Bus Interchange” which may have prompted him to ask *B* whether he was actually at the bus “terminal”. Thus, *A*’s encounters with the sign and *B*’s SMS was not the result of a deliberate search for bus related information even though bus routes were present in his projection from the start. The example, also illustrates that wayfinders re-contextualised information. Sometimes recipients reacted to serendipitous information by generating immanent projections. For example, a group projection was to disperse in search for the target and wayfinders maintained distance between each other, for example near *A* saw *B* head off towards a particular park so headed in another direction. Like daisy chaining, past and future actions and interactions in berrypicking have “reciprocal impact” [1:56] and an emergent “arc”. However, berry-picking describes rationalizing acquirement of information after the information has been acquired.

Individual wayfinders differed in acquiring and responding to berries. *A*’s scheme favoured adaptive decision-making and accumulating serendipitous information. While, least familiar with the area he was unperturbed by being unable to associate a heading with a known target. His wayfinding corresponds with people in unfamiliar terrain who hastily construct routes which they modify opportunistically [23]. Despite his speed *A* referred to information that can be considered to arise in unreflective, “thrown” [e.g. 13] interactions with the world. For example, when guiding *B* to the target *A* referred to a gentle incline that was undetected by his accompanying observer. *A* also clearly situated his guidance in other wayfinder’s SMS, for example adjusting subsequent route instructions to their reported positions. Confusion arose due to differences in *C*’s and *A*’s berrypicking for example despite walking close by them *C* was confused by landmarks *A* had noticed earlier used in route instructions.

3. TRAJECTORIES IN THE WILD

The metaphors derived generalized patterns of interaction indicative of trajectory from detailed data. While, accounting for all berries or daisies is implausible the patterns of picking and chaining enable more transparently articulating our references between situations and activities [e.g. 24] than tends to occur using a task-centric approach. Daisy-chaining and berrypicking interact to influence trajectory and portray linear and non-linear relations conditioning people’s momentary interactions during wayfinding. The metaphors denote embodied interaction in wayfinding as a ludic pursuit [e.g. 25] involving tactile experience and where structures emerge from playful manipulating objects. We leverage this sense to explore informational and affective dependencies situated in wayfinding during activities in which the environment is a resource for pleasure. Our aim is to elucidate

factors that can be used to assist visitors' in developing schemes for landmark acquisition and use that bear some of the positive qualities of local people's schemes. We explore wayfinding trajectories at various granularities to ascertain a clearer description of the contribution of daisy-chaining and berry-picking to emergent trajectory phases.

We are designing a guide to support enjoyment of the 112 sites in the Wet Tropics World Heritage Area (WTWHA). These sites offer rich nature-based experiences from bush-walks, of different lengths and difficulties, to peaceful swims in creeks and lakes. Despite comparable accessibility and facilities there is significant visitor over-use of a few these sites while many others are visited only by local people. Thus, the former suffer biophysical impacts while the latter's tranquility is preserved. We intend our guide to enable visitors to appreciate our natural environment more widely and with the same relaxed, spontaneity as local people. We aim to support the scenario of the Oak family on holiday in the tablelands of FNQ for the first time. Far from their suburban Melbourne domiciles, each day unfurls "intuitively". For example, after lunch at a village market and a leisurely rainforest walk mum and dad serenely watch the children swim in billabong. Despite intermittent coverage amidst the forested gorges a GPS-enabled camera-phone enables the Oak's to "discover" this delightful spot.

An extensive data set [e.g. 26] depicts some of the projections coupling visitors' wayfinding with the physical landmarks of a WTWHA site. Detailed content analysis of 2,388 items of primary, not replicated, printed material (e.g. maps, pamphlets, brochures) distributed through 38 information venues in the region is informative of daisies and berries visitors' first encounter in WTWHA. This corpus of material was composed of 65% images, 76% maps and 58% text. Correlations between site representation and visitation suggest this material determines visitors' destinations, activities engaged in at sites and the cultural 'space' shaping expectations [26: 43]. Interviewing 300 visitors in situ at several sites reveals the extent that exposure to particular material influenced experiences of the site, including senses of satisfaction and orientation. A clear difference between visitors' and locals' likely projections emerges from the type of information represented in this material. For example, 61% of the photos were of landscapes rather than specific locations. Further, analyses more specifically determine the salience and legibility of landmarks in these representations to elucidate its mediation of their interactions with information in the terrain. We seek to clarify visitors' projections situated in the material prior to their physical encounters to better understand their schemes in situ.

We are beginning to capture data on local people's and visitors' acquisition and use the daisies and berries in situ. Data [e.g. 26] from expert analysis, by environmental psychologists, of informational characteristics of two sites and surveys of visitors in these settings explored orientation, regulation and interpretation information. This shows that approximately 50% of visitors' satisfaction with WTWHA sites relates to the availability and legibility of information and symbolic and meaning in and about the sites. We extend this data set by focusing on the meanings of sites frequented by local people. We probe and depict in situ data using an extended variant of the P&O activity. "Locals" capture images and text using a customised GPS enabled camera phone, with outgoing calls disabled. Images and text are stored in two directories. The first contains daisies, or items that the participant believes are salient to a sequence of landmarks along an enjoyable route in the site. The second directory contains berries or items that are notable to the local for other reasons, for example

landmarks that have floral/fauna/cultural interest or evoke specific emotions/physical sensations (e.g. hunger, exertion, energy, heat). We aim to distil and integrate local's and visitors' projections and schemes to develop prototypes to evaluate with visitors.

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