Embodied Spatial Cognition in Tangible Computing

BRENDAN ALEXANDER HARMON, North Carolina State University
ANNA PETRASOVA, North Carolina State University
VACLAV PETRAS, North Carolina State University
HELENA MITASOVA, North Carolina State University
ROSS KENDALL MEENTEMEYER, North Carolina State University
EUGENE BRESSLER, North Carolina State University
ART RICE, North Carolina State University

CCS Concepts: •**Human-centered computing** → **Human computer interaction (HCI); Laboratory experiments;**

Additional Key Words and Phrases: Human-computer interaction, tangible interfaces, interaction design, physical computation, embodied cognition, spatial thinking, geospatial modeling

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Author's addresses: B. A. Harmon and A. Petrasova and V. Petras and H. Mitasova and R. K. Meentemeyer, Center for Geospatial Analytics, North Carolina State University; B. A. Harmon, E. H. Bressler and A. Rice, Department of Landscape Architecture, North Carolina State University.

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Table I. Coupling experiment: percent cells

Method	Concentrated flow	Ridges	Valleys
Reference	0.89	2.10	2.90
Digital	1.12	0.69	0.56
Hand	0.80	4.00	1.66
Augmented	0.77	4.13	1.48

Table II. Percent cells with ridges

Method	Reference	Mean	Stdev
Difference	4.27	3.46	3.25

Table III. Difference experiment: percent cells

method	concentrated flow		ridges		valleys	
	reference	mean	reference	mean	reference	mean
difference	1.07	0.73	4.27	3.46	2.96	0.22

Table IV. Water flow experiment: percent cells

method	concentrated flow		ridges		valleys	
	reference	mean	reference	mean	reference	mean
water flow	2.55	1.99	1.18	3.72	4.77	3.86

Table V. Mean minimum distance (ft) of features from reference features

Method	Concentrated flow	Ridges	Valleys
Digital	12916	110419	98806
Hand	10162	24005	676450
Augmented	7121	19599	31401
Difference	25073	35656	114378
Water flow	28321	37918	26166

Table VI. Percent cells

method	concentrated flow		ridges		valleys	
	reference	mean	reference	mean	reference	mean
digital	0.89	1.12	2.10	0.69	2.90	0.56
hand	0.89	0.80	2.10	4.00	2.90	1.66
augmented	0.89	0.77	2.10	4.13	2.90	1.48
difference	1.07	0.73	4.27	3.46	2.96	0.22
water flow	2.55	1.99	1.18	3.72	4.77	3.86