Workshop do Núcleo de Apoio à Pesquisa em Software Livre

São Carlos, 16 a 17 de Outubro de 2014.

CAED

Laboratório de Computação Aplicada à Educação e Tecnologia Social Avançada

Seiji Isotani (ICMC-USP)

sisotani@icmc.usp.br

CAED

- **Laboratório de Computação Aplicada à Educação e Tecnologia Social Avançada** (CAEd) created in 2012
- Main objective: investigate, develop and apply computational techniques to solve educational problems.
- We work in a multidisciplinary environment focusing on generating **cutting-edge knowledge** e **technological products** with potential to support the process of teaching and learning.

Principal Investigators (PIs)

Ellen Francine Barbosa

PhD. USP

Seiji Isotani

PhD. Univ. of Osaka, Japan
Postdoc. Carnegie Mellon, USA

José Carlos Maldonado

PhD. Unicamp
Postdoc. Purdue University, USA

CAED

Group on Intelligent and Interactive technology

Seiji Isotani - PI

Team

PhD Students


Cida


Fernando


Geiser


Helena

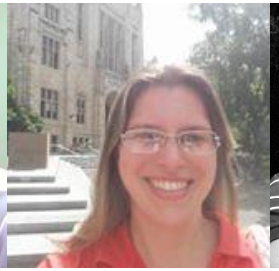

Rachel


Simone

Master Students


Jacinto


Kamila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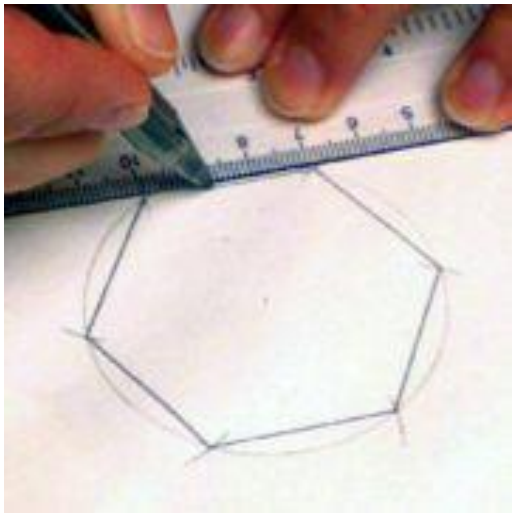
Wilmax

CAED

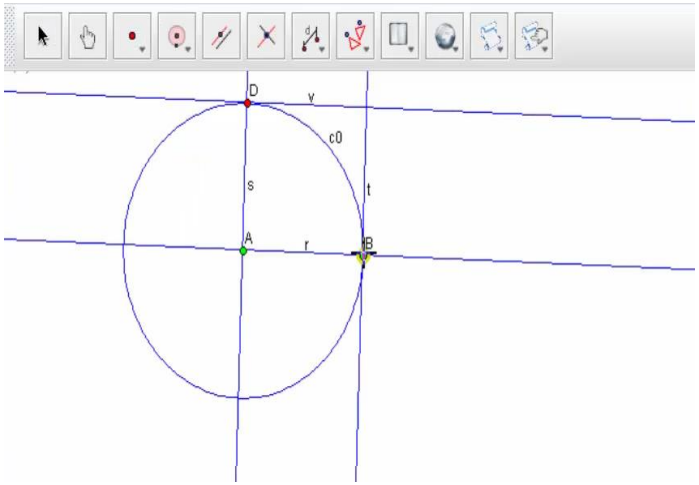
Designing Interactive Geometry Software using a Gesture Interface for Mobile Devices

Interactive Geometry (IG)

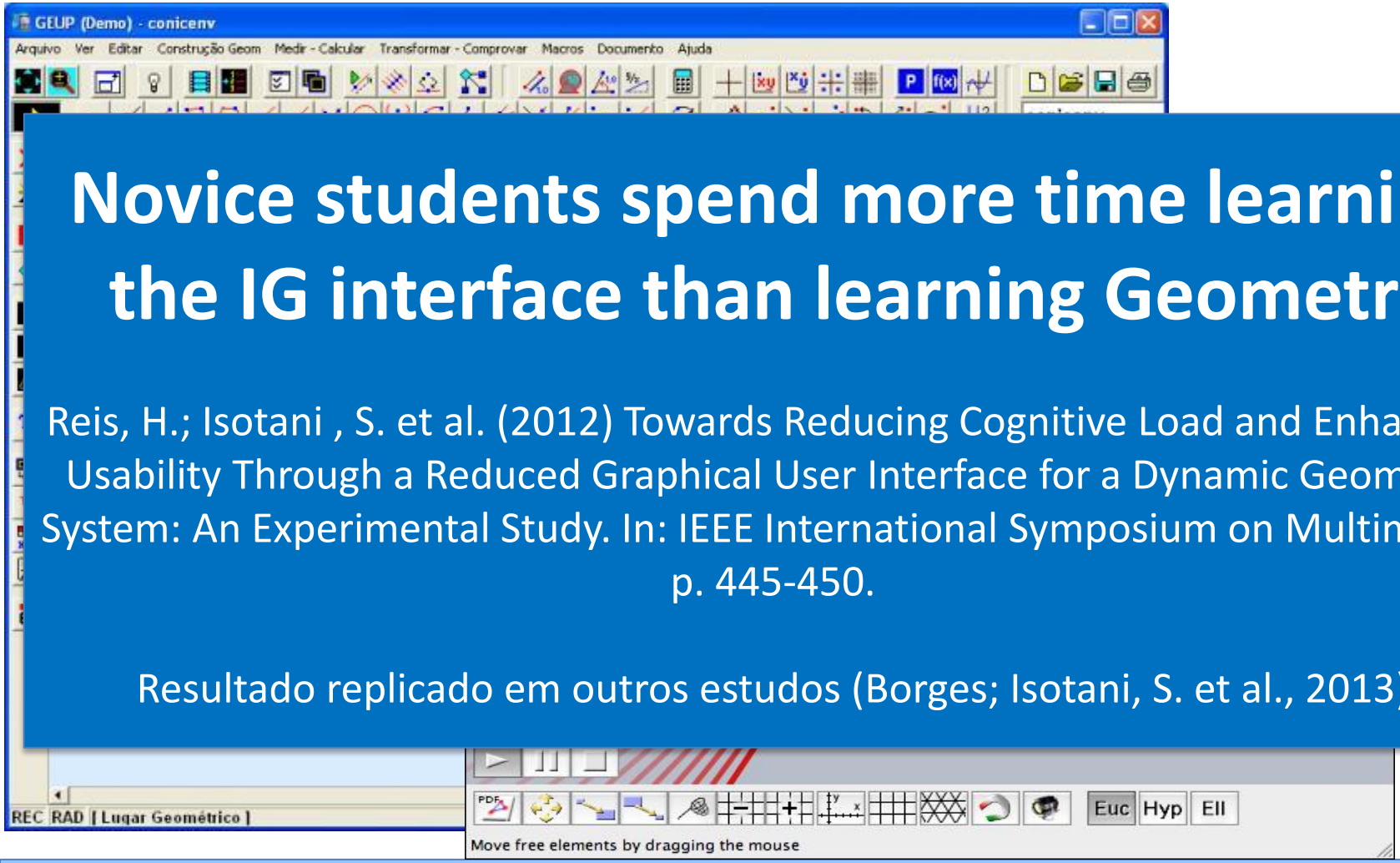
Traditional Tools



Interactive Geometry



The Problem



Novice students spend more time learning the IG interface than learning Geometry

Reis, H.; Isotani , S. et al. (2012) Towards Reducing Cognitive Load and Enhancing Usability Through a Reduced Graphical User Interface for a Dynamic Geometry System: An Experimental Study. In: IEEE International Symposium on Multimedia, p. 445-450.

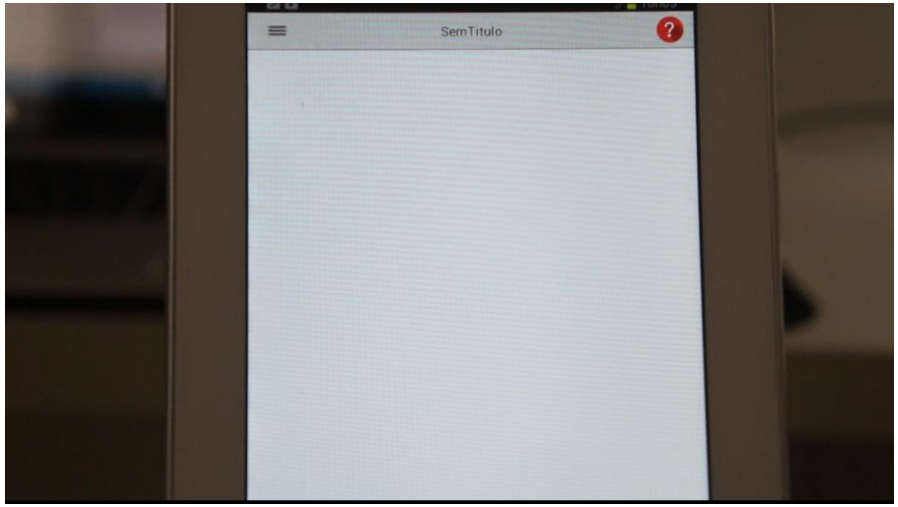
Resultado replicado em outros estudos (Borges; Isotani, S. et al., 2013)

Research Question

- RQ01: Is It possible to propose new ways of interacting with interactive geometry software (IGS)?
  - Particularly, is it possible to propose interfaces that do not use icons/buttons to create geometric objects?

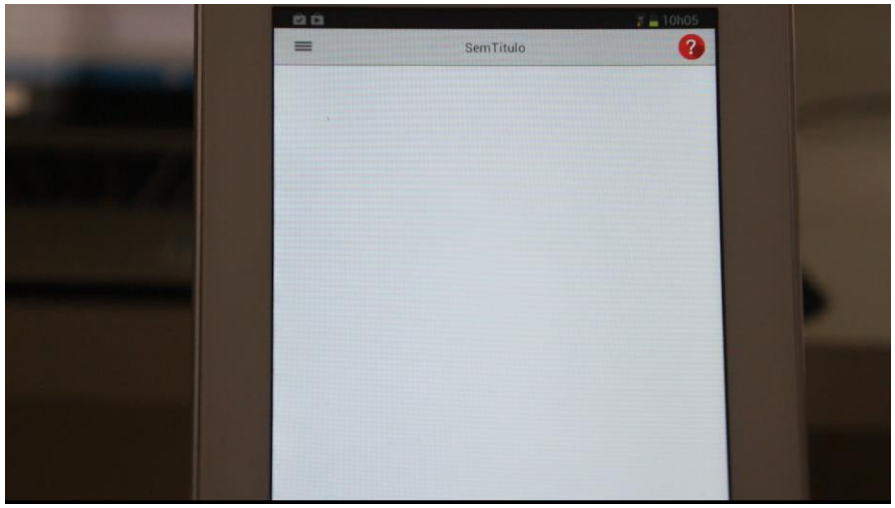
Gesture Analisys and representation

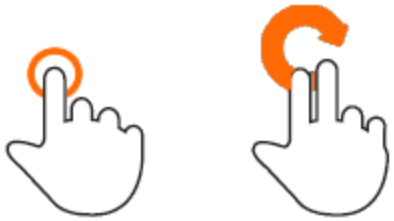
- Line



Gesture Analisys and representation

- Circunference:





Ponto

Toque Breve

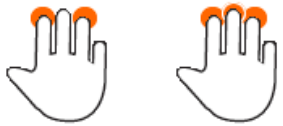
Toque brevemente com o dedo na tela.

Basic Gestures

Ponto Médio

Toque Breve

Pressione dois dedos na tela e depois pressione o do meio na tela.



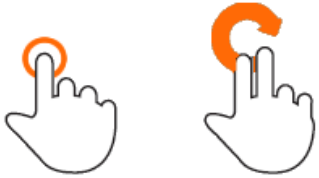
Core Gestures

ry

Circunferência

Toque Breve + Rotação

Toque brevemente com o dedo para criar o ponto central e fazer a rotação envolta deste ponto.



Basic Gestures

Circunferência definida por um segmento de reta

Toque Breve + Movimento + Rotação

Tocar brevemente duas vezes na tela em lugares separados e movimentar um dedo por cima destes dois toques breves. Fazer o movimento de rotação em volta da reta criada.

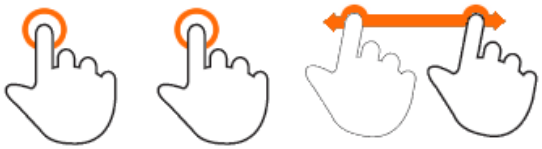
Basic Gestures

Gesture standardization for IG Software

Reta

Toque Breve + Movimento

Criar dois pontos e traçar uma reta, fora de um raio de pro-ximidade (Passar por cima dos dois pontos)



Basic Gestures

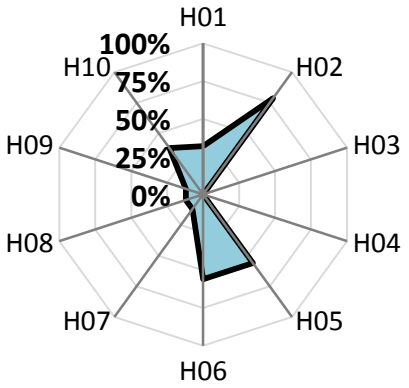
Semi-Reta

Toque Breve + Movimento

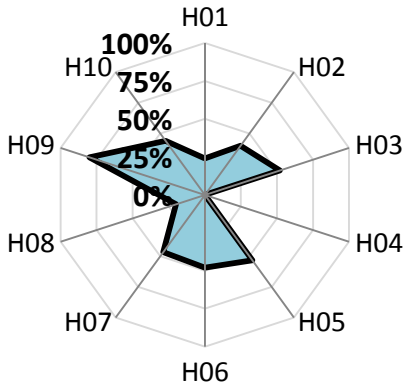
Criar um ou dois pontos, traçar uma reta dentro do raio de um dos pontos e passar pelo outro.

Basic Gestures

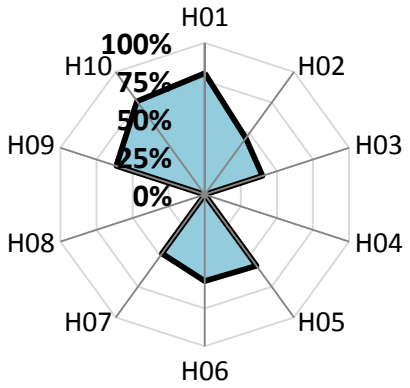
Comparative Usability Test (Severity)



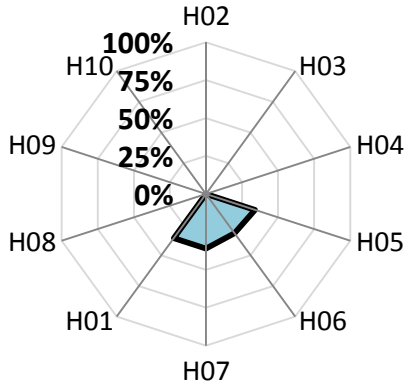
Geogebra



Geometry Pad



Sketchometry



GeoTouch

Reis, H. M. ; Borges, S. S. ; Isotani, S. . Análise de Usabilidade de Sistemas de Geometria Interativa para Tablets. RENOTE. Revista Novas Tecnologias na Educação, v. 12, p. 1-10, 2014.

GeoTouch – GI for Mobile Devices

Google Play:

play.google.com/store/apps/details?id=com.usp.icmc.tgeo

Google Play:
http://youtu.be/iO60mSXRO54

JOINT

JOINT

JAVA ONTOLOGY INTEGRATED TOOLKIT

JOINT - Team

Ig Ibert

Seiji Isotani

Armando Barbosa

Olavo Holanda

Endhe Elias

Williams Alcantara

Judson Bandeira

JOINT

- A toolkit that supports the development of ontology based applications;
- It provides an integration of existing technologies and techniques to create a unified environment;
- Main goal: **Easy** and **efficient** development of ontology-based application.

- Services provided:
  - Instances manipulation – CRUD (Object-oriented paradigm):
  - Ontology operations;
  - Java code generator;
  - Queries with SPARQL;
  - Reasoning over SWRL;
  - Etc ...

Empirical Study

Development Productivity

Group	Machines	Tool
F5	**Intel Core I5, 4GB de RAM**	**JOINT**
F3	**Intel Core I3, 4GB de RAM**	**JOINT**
J5	Intel Core I5, 4GB de RAM	Jastor and Jena
J3	Intel Core I3, 4GB de RAM	Jastor and Jena

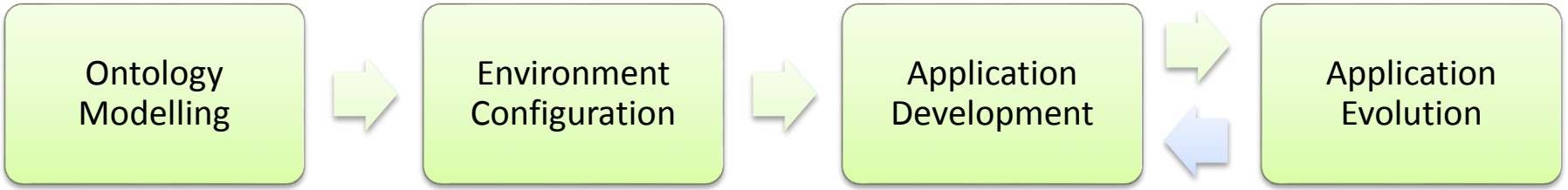
Group	Development Time	Codes Lines	Running Time	Memory Usage
F5	**7 hours**	**72 lines**	**2584 ms**	**15,4 MB**
F3	**6 hours**	**81 lines**	**3757 ms**	**16,2 MB**
J5	15 hours	89 lines	4070 ms	61,5 MB
J3	18 hours	84 lines	4144 ms	52,2 MB

Holanda, O. ; Isotani, S. ; Bittencourt, I. I. ; Elias, E. ; Tenório, T. . JOINT: Java ontology integrated toolkit. Expert Systems with Applications, v. 40, p. 6469-6477, 2013.

JOINT

Java Ontology Integrated Toolkit(JOINT)

http://jointnees.sourceforge.net/



JOINT

- Joint Economical Impact
  - Startup MeuTutor http://www.meututor.com.br started in 2011, 500k investiment, Market value 10M
  - Winner: Salão de Inovação RioInfo,
    Olimpíada USP de Inovação,
    Prêmio Alagoano Empreendedor Inovador

JOINT

- W3C request under study: startup on Linked Open Data using JOINT