

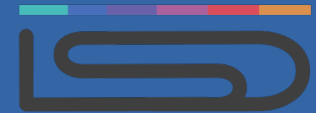
CIÊNCIA CIDADÃ BASEADA EM CROWDSOURCING

Engajamento e Credibilidade de Participantes

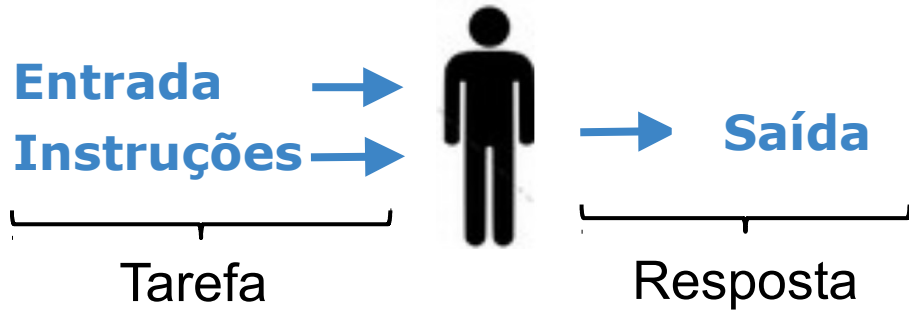
Lesandro Ponciano
@lesandrop



LABORATORIO
DE **SISTEMAS**
DISTRIBUÍDOS



Ciência Cidadã com Crowdsourcing



The screenshot shows the Sun4All interface. At the top, the title "Sun4All" is displayed in a red header bar, along with social media icons for information, Twitter, Facebook, and Google+. Below the header, a text line states: "Esta imagem foi obtida no dia 1 de Setembro de 1995". The main area features a large circular grayscale image of the Sun. To the right of the image is a control panel with the following elements:

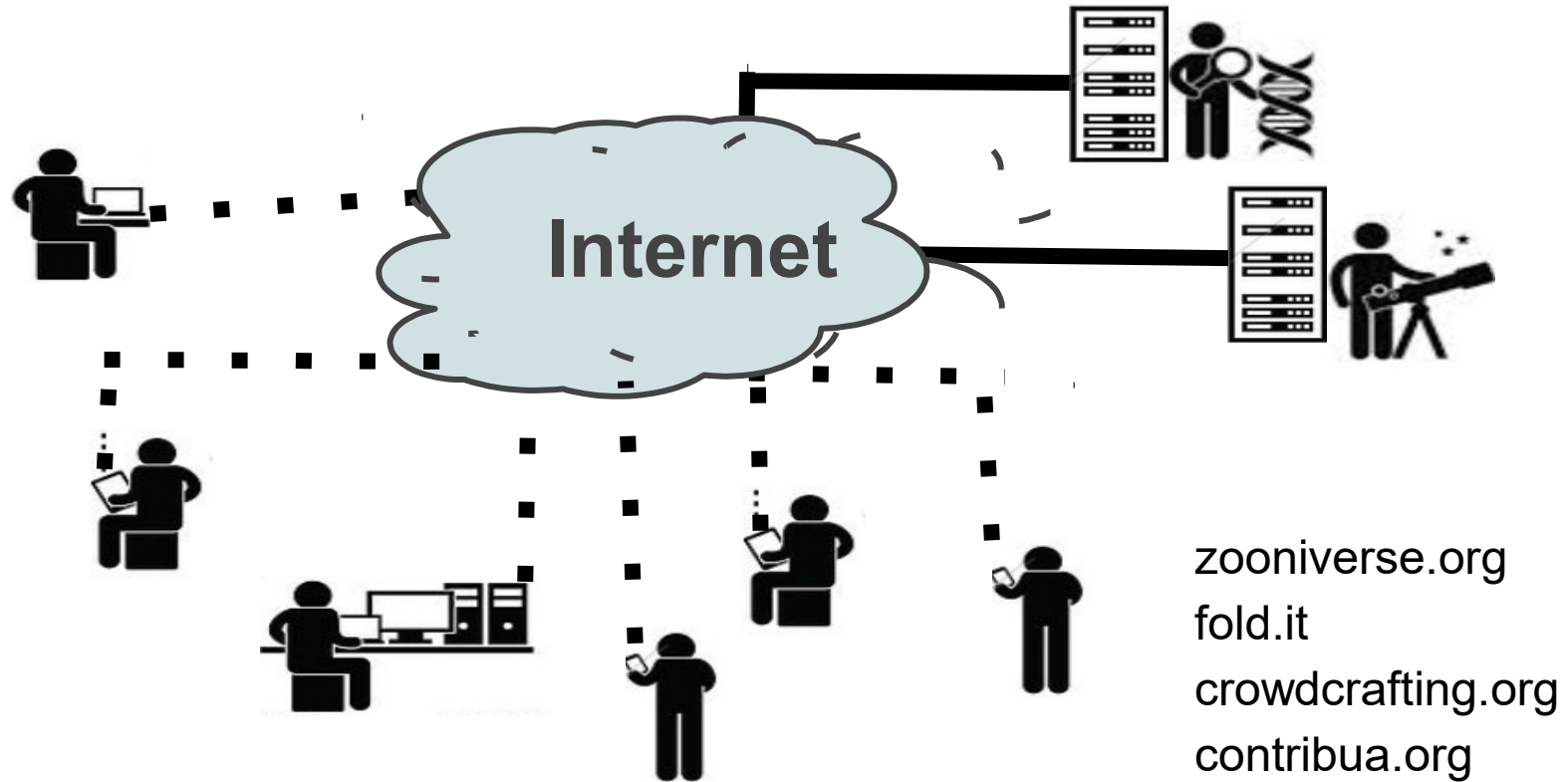
- Observação** (Observation) section:
 - Yellow button: "Marcar Mancha" (Mark Spot)
 - Teal button: "Marcar Grupo" (Mark Group)
 - Gray button: "Remover Mancha/Grupo" (Remove Spot/Group)
 - Text: "Outra informação:" (Other information:)
 - Empty text input box
- Dados** (Data) section:
 - Text: "Número de manchas: 0" (Number of spots: 0)
 - Text: "Número de grupos: 0" (Number of groups: 0)
 - Green button: "Tarefa Concluída!" (Task Completed!)
 - Yellow button: "Recomeçar!" (Restart!)

Below the image, there is a navigation bar with a search icon, "Tamanho original" (Original size), a magnifying glass icon, and navigation arrows (down, up, left, right). A green button labeled "Inverter imagem" (Invert image) is also present.

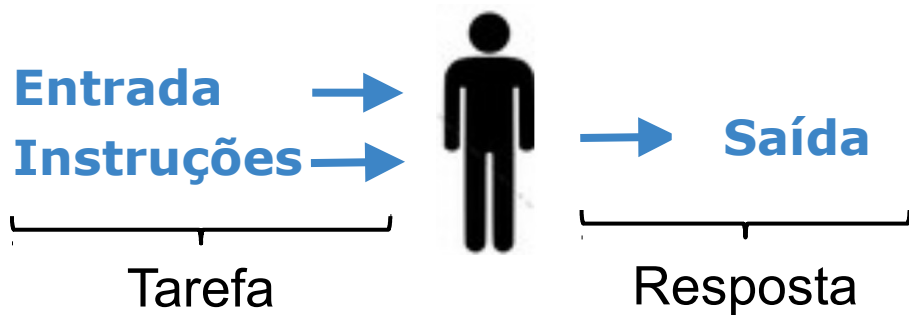
The screenshot shows the Galaxy Zoo classification interface. On the left is a grayscale image of a galaxy. On the right, the text reads: "Classify galaxies" and "Answer the question below using the buttons provided." The question is: "Is the galaxy simply smooth and rounded, with no sign of a disk?". Below the question are three buttons: "Smooth" (with a smooth galaxy icon), "Features or disk" (with a spiral galaxy icon), and "Star or artifact" (with a star icon and a red X). At the bottom of the interface, there are two buttons: "Invert galaxy image" and "Add to my favourites".

The screenshot shows the Galaxy Zoo classification interface with a colorful galaxy image. On the left is a vertical toolbar with icons for zooming, panning, and other navigation functions. The main area displays a colorful image of a galaxy with a red core and green and blue features. At the bottom, there is a "SUBMIT" button.

Sistemas de Ciência Cidadã baseados em Crowdsourcing



Ciência Cidadã com Crowdsourcing



This screenshot shows the Sun4All web interface. At the top, the title "Sun4All" is displayed in a red header bar, along with social media icons for information, Twitter, Facebook, and Google+. Below the header, a note states "Esta imagem foi obtida no dia 1 de Setembro de 1995". The main area features a large, circular, grayscale image of a sunspot. A semi-transparent gray box is overlaid on the image, containing the text "300 participantes" in blue. To the right of the image is a control panel titled "Observação" (Observation) with buttons for "Marcar Mancha" (Mark Spot), "Marcar Grupo" (Mark Group), and "Remover Mancha/Grupo" (Remove Spot/Group). Below these buttons, it shows "Número de manchas: 0" and "Número de grupos: 0". At the bottom of the panel, there are buttons for "Tarefa Concluída!" (Task Completed!) and "Recomeçar!" (Restart!). At the bottom of the interface, there are navigation controls including "Tamanho original" (Original Size), zoom in/out arrows, and "Inverter imagem" (Invert Image).

This screenshot shows the Galaxy Zoo crowdsourcing interface. The main display area shows a galaxy image with a red 'X' over it, indicating a classification. The text "Classify galaxies" is at the top, followed by the instruction "Answer the question below using the buttons provided." The question is "Is the galaxy simply smooth and rounded, with no sign of a disk?". Below the question are two buttons: "Star or artifact" (with a red 'X') and "Disk" (with a green checkmark). A large gray box is overlaid on the image, containing the text "86.413 participantes" in blue. At the bottom of the interface, there are buttons for "Invert galaxy image" and "Add to my favourites".

This screenshot shows the Galaxy Zoo 2 crowdsourcing interface. The main display area shows a galaxy image with a red 'X' over it, indicating a classification. The text "Classify galaxies" is at the top, followed by the instruction "Answer the question below using the buttons provided." The question is "Is the galaxy simply smooth and rounded, with no sign of a disk?". Below the question are two buttons: "Star or artifact" (with a red 'X') and "Disk" (with a green checkmark). A large gray box is overlaid on the image, containing the text "26.889 participantes" in blue. At the bottom of the interface, there are buttons for "Invert galaxy image" and "Add to my favourites".

Engajamento dos Participantes

- Qual o **grau** e a **duração** da participação das pessoas nos projetos?



Taxa de
atividade

Tempo dedicado
diariamente

Variação na
Periodicidade

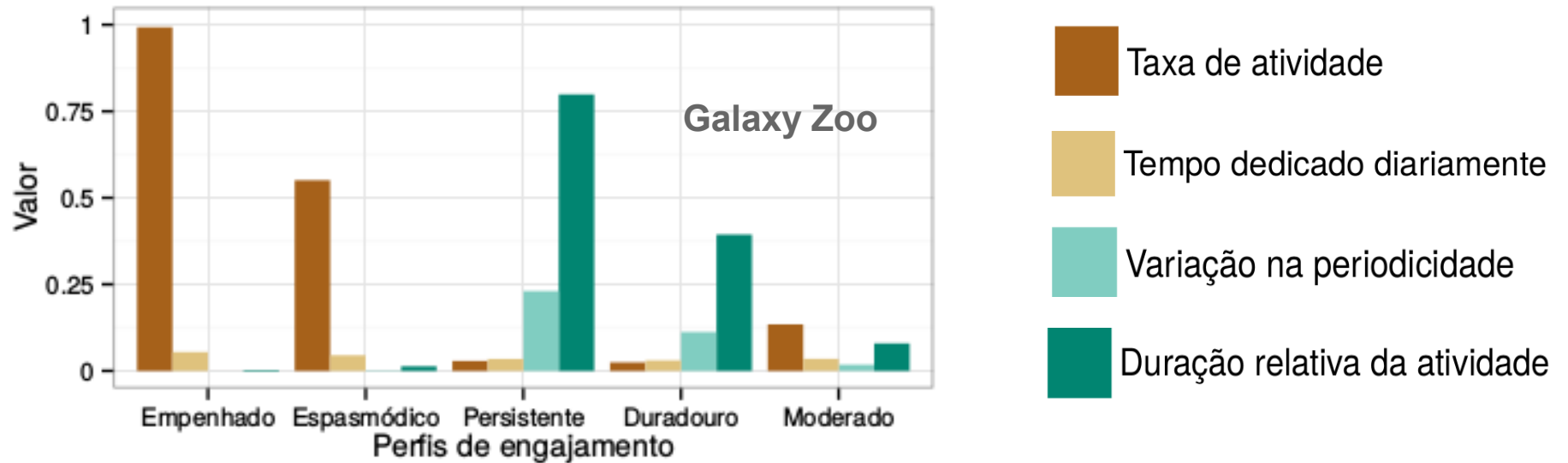
Duração Relativa
da atividade

Engajamento Desigual

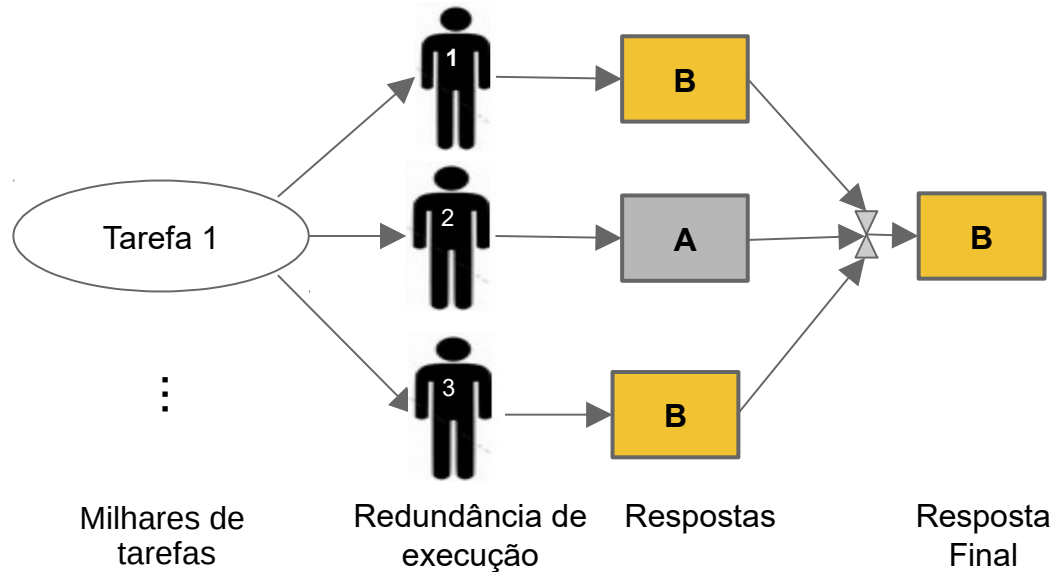
Participam por mais de 1 dia

	<u>Minoria</u>	<u>Importante</u>
Galaxy Zoo	36%	86%
The Milky Way Project	28%	84%
Cell Spotting	42%	90%
Sun4All	35%	70%
Análise de Sentimentos	41% dos participantes	93% do tempo dedicado

Diversos Perfis de Engajamento



Validade de Dados por Replicação

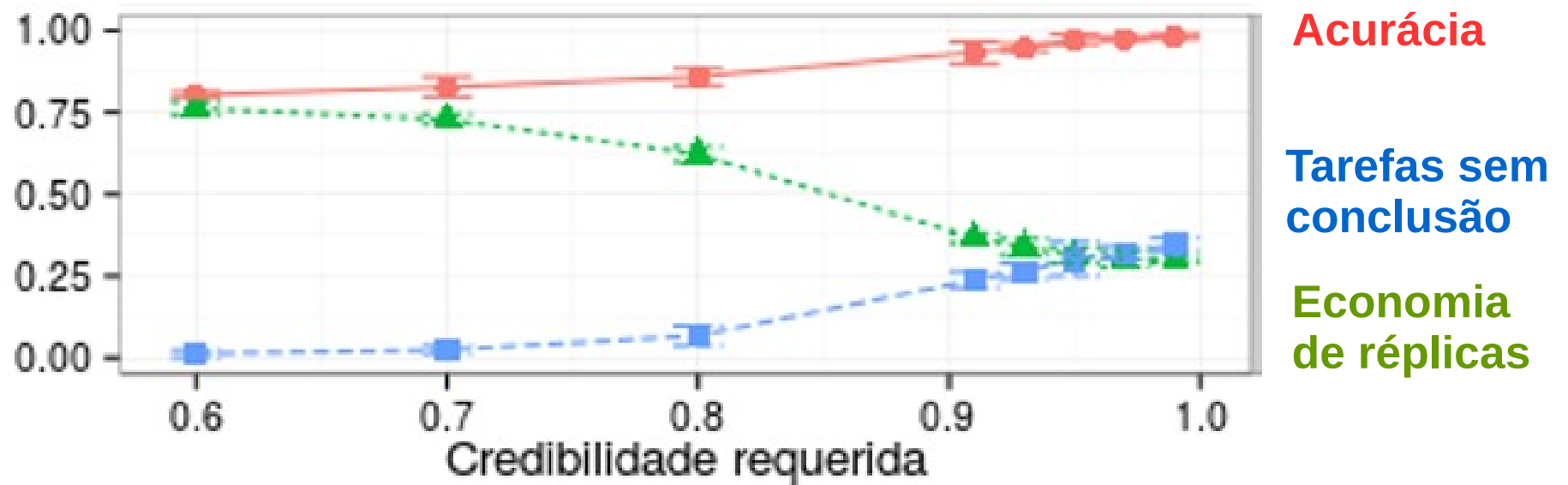


- Com **alta redundância**, garante-se uma resposta correta em aproximadamente 90% das tarefas
 - Exemplo: Média de 30 pessoas por tarefa no projeto Galaxy Zoo
- Não seria um **desperdício** da contribuição das pessoas que se engajam?

Replicação baseada em Credibilidade

- Estimar a credibilidade de cada participante
 - Precisão do participante -> concordância com outros
 - Dificuldade da tarefa -> entropia
- Replicação baseada na estimativa de credibilidade
 - O cientista define a credibilidade requerida na resposta final
 - O algoritmo replica a tarefa para os participantes
 - Estima-se a credibilidade dos participantes e das respostas
 - A replicação é interrompida quando uma resposta crível é obtida

É Mais Eficaz e Eficiente!



↑
Nível de credibilidade desejada pelo cientista

Mensagens para Levar para Casa

- Poucas pessoas se engajam de forma duradoura
 - A maioria participa em 1 dia e não volta mais
 - Os que continuam são fundamentais para o sucesso do projeto
- As pessoas tendem a ser críveis
 - Erros são raros e geralmente não intencionais
 - Abandonam tarefas que percebem como “difíceis”
- Validade por replicação baseada em credibilidade
 - Eficaz e eficiente

Quer Saber Mais? Veja Nossos Artigos!

PONCIANO, Lesandro et al. Volunteers' Engagement in Human Computation for Astronomy Projects. **Computing in Science & Engineering**, v. 16, n. 6, p. 52-59, 2014.

PONCIANO, Lesandro; BRASILEIRO, Francisco. Finding Volunteers' Engagement Profiles in Human Computation for Citizen Science Projects. **Human Computation**, v. 1, n. 2, p. 247-266, 2014.

PONCIANO, Lesandro et al. Adaptive Task Replication Strategy for Human Computation. In: **Computer Networks and Distributed Systems (SBRC), 2014 Brazilian Symposium on**. IEEE, 2014. p. 249-257.

Obrigado!

Lesandro Ponciano
@lesandrop
lesandrop@lsd.ufcg.edu.br



LABORATORIO
DE **SISTEMAS**
DISTRIBUÍDOS

