



**GDAŃSK UNIVERSITY
OF TECHNOLOGY**

Game with a Purpose for Verification of Mappings Between Wikipedia and WordNet

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Mappings, tags, extractions

1. We need them
2. We create them either on the fly or before
3. We use them to integrate systems
4. How do we evaluate them?



Mappings evaluation

1. Statistical result analysis
2. Precision and recall
3. Confusion matrix
4. F-measures
5. But what do they tell us? Do we really know if given entry is correct?



The full verification

1. Very hard to do
2. We can analyze a portion of the results
3. What to do when we have over a million of mappings?
4. How to verify tags? What would be the cost?



Crowdsourcing

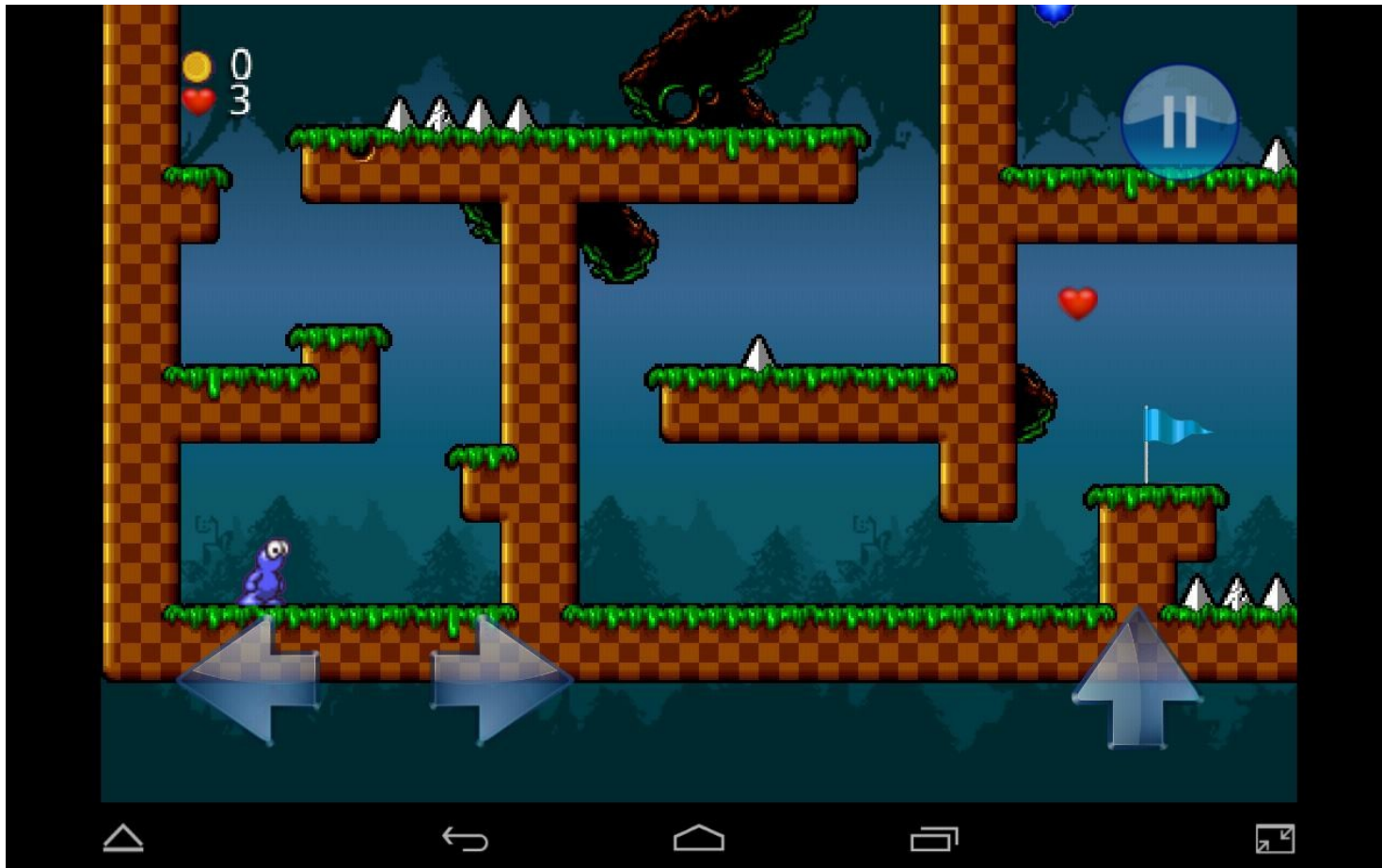
1. Lets try and create community around it!
2. We can trust the initial results to some extent but try to make them better over time
3. We can embed the problem in some other products, like a quiz game or a captcha mechanism



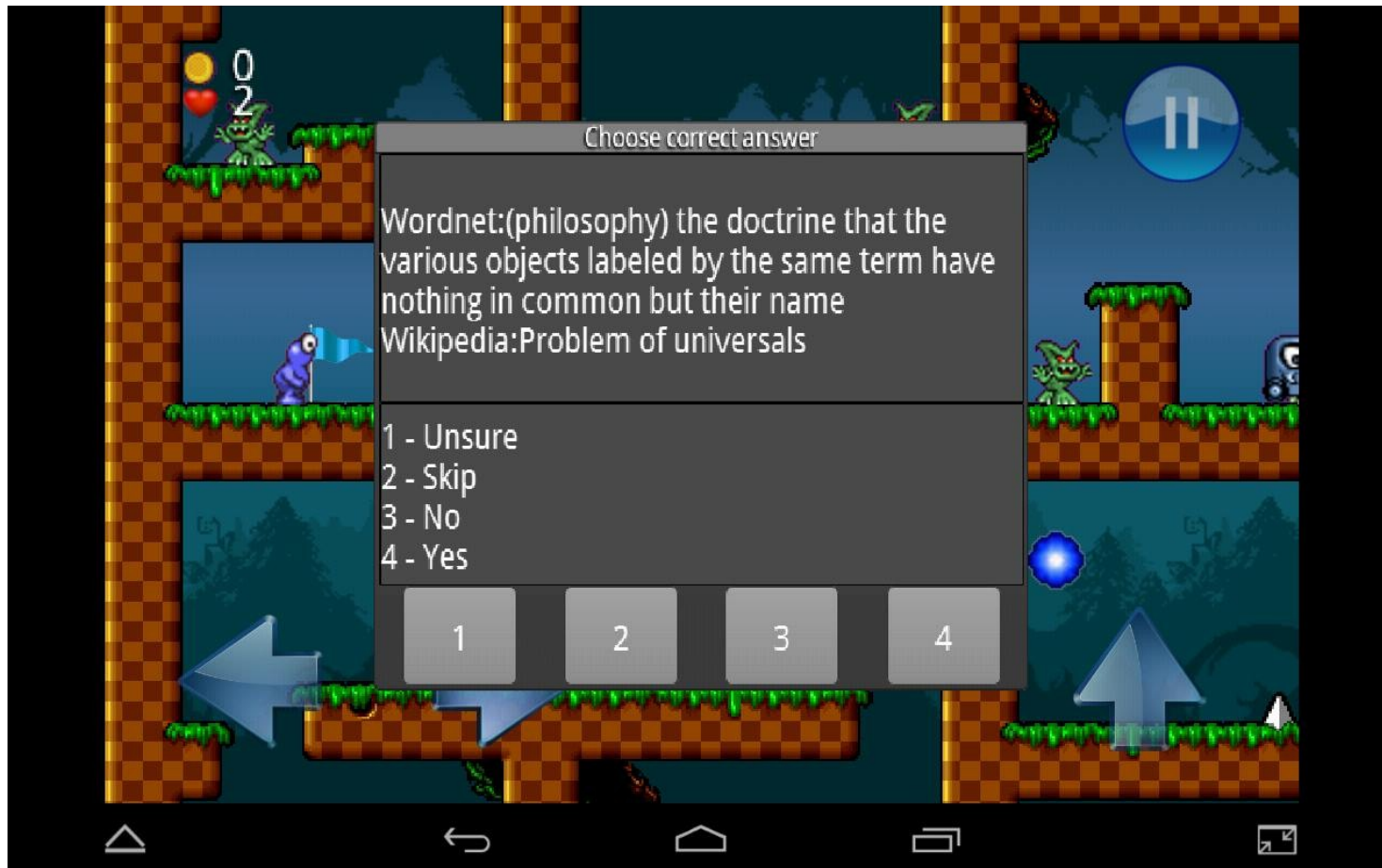
TGame as a proof of concept

1. A simple platform game for Android platform, available on Google Play
2. Checkpoint activation requires the player to solve a puzzle
3. Semi-easy error report possibility
4. Mappings between Wikipedia and WordNet were used as an example (generated using Colabmap project, <http://julian.eti.pg.gda.pl/colabmap>)

TGame as a proof of concept (2)

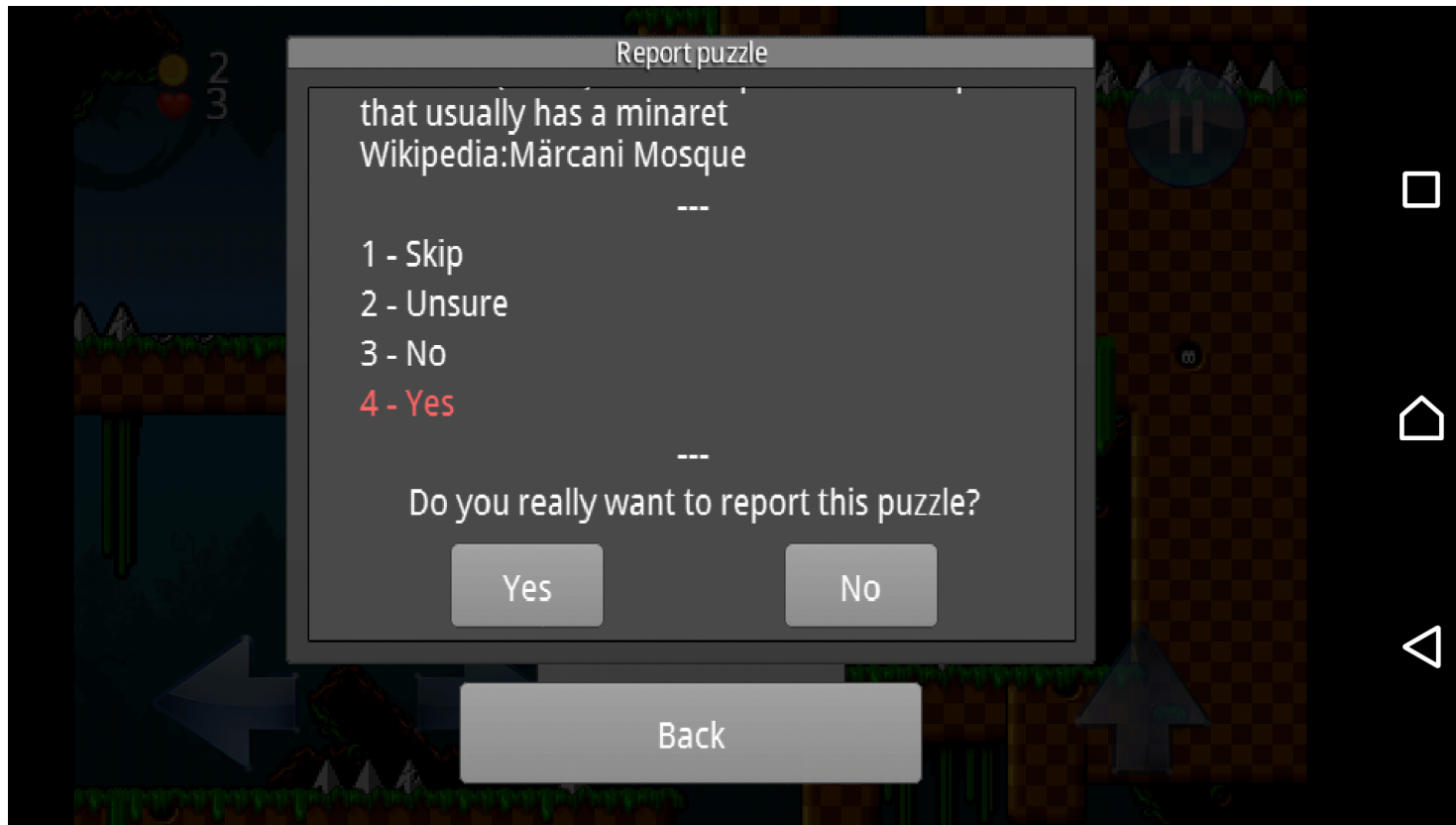


TGame as a proof of concept (3)





TGame as a proof of concept (4)





When to update mappings?

1. The mapping was considered correct when 75% of the player answers agreed. This approach however did not give any results as only 50% of original mappings managed to get enough answers, none of the incorrect mappings were marked as correct.
2. The mapping was considered correct when at least 50% of player answers agreed. In this case 64% of all mappings were marked as correct which covered 75% of all mappings marked as correct in our database. Unfortunately this method generated some false positives.
3. The mapping which gathered the most of the player answers was considered correct. In this case 74% of all mappings were marked as correct which covered 80% of all mappings originally marked as correct in our database. This method also generates false positives.



How to ask questions?

1. This is one of the biggest challenges
2. Originally we generated additional “close” mappings
3. This approach did not work very well as the possible answers could be very similar or required a very high level of expertise
 1. The Question: Asiatic nut trees: wing nuts
 1. Answer 1: Pterocarya
 2. Answer 2: Pterocarya fraxinifolia
 3. Answer 3: Pterocarya stenoptera
 4. Answer 4: Cyclocarya
4. Currently we are trying a set of questions in form WordNet definition, Wikipedia page, Yes/No/Unsure



How to verify the verification?

1. Volunteering computing approach – multiple answers are required
2. We measure the time it actually took to give answer
3. Reports require some effort
4. Players can be “weighted” based on their action history or reputation
5. The final decision is up to the administrator of the data set



Community creation

1. Second big problem
2. We need the effect of scale
3. Games tend to gather large audiences but for a short period of time
4. Currently we are developing 2 clients – a platform game and a quiz game
5. Captcha mechanism is easier to popularize but does not induce community



Community creation (2)

1. Gaming approach requires good clients but also some added value
2. Profiles
3. Trophies/Achievements
4. “Ego driven”



How the solution can be used?

1. Mappings verification
2. Image tagging verification
3. Data acquisition
4. Depending on the form of a question we actually do not require experts



Current state

1. Server side mechanisms and a platform game client are ready
2. We are implementing trophies and the social layer
3. A quiz game is being implemented and the mappings are evaluated in terms of their difficulty
4. Generalization of the questions and answer types is being implemented
5. A captcha component is being implemented
6. Integration of the above solutions will be started shortly