# CS3243 Team Project Report: Learning to Play Tetris with Big Data!

## *Team Number 05*

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## Agent’s strategy

Heuristics

1. Aggregate Heights = the sum total of all the column heights
2. Bumpiness = the sum total of all the height differences between adjacent columns
3. Maximum Height = the height of the highest column
4. Holes = number of empty squares on the grid where there is another square directly above it
5. Clearing Rows = the number of full rows on the grid

Deciding the weight values using a genetic algorithm

## Experimental results demonstrating the agent’s performance

## Observations and analysis to discuss why your strategy performs well or doesn’t

* State clearly and explicitly the novel and significant contributions and achievements of your team that will distinguish your agent’s strategy and project work from the other teams and existing literature

## Prove the learning method can scale up to big data

* Describe the novel learning method that is EXPLICITLY designed and implemented to handle big data
* Empirically demonstrate through experiments that it can indeed scale up to big data – report the speed up – while preserving the agent’s good learning performance
* Consider parallel / distributed learning on multiple cores / machines

## Wow factor – examples:

* An interesting approach to learning from data
* An unorthodox choice of features
* A novel agent design paradigm
* ((worth 4%))

## Resources

Tetris AI - The (Near) Perfect Bot by Yiyuan Lee, April 2013 <https://codemyroad.wordpress.com/2013/04/14/tetris-ai-the-near-perfect-player/>

Tetris AI Explained by Cédric Jules, March 2013 <http://totologic.blogspot.sg/2013/03/tetris-ai-explained.html>

On the Playing of Tetris by Eric Whitman, Breelyn Kane and Donald J. Burnette, <http://www.cs.cmu.edu/afs/cs/project/ACRL/www/TetrisReports/Breelyn_Eric_Don_Project.pdf>

<https://l.facebook.com/l.php?u=https%3A%2F%2Fcdn.fbsbx.com%2Fv%2Ft59.2708-21%2F29213081_1833627283356682_2127242764214075392_n.pdf%2FStanford_Tetris.pdf%3Foh%3Dfde5e006ed6dce1a053b8baadee8e5b2%26oe%3D5AB3918E%26dl%3D1&h=ATOQWOyyxma-BHZtXvrjFYbs8pGC-FxFDaDp4nFjG_2AkleSuPHNJVILwXjaVm1iN4YUghFZ4CMh_ZYcwkKQLrU3udZmrp94VPljciHISTVTtYB9w618uvmwUP0EKT1m_jUO5MQhkok&s=1>

Coding a Tetris AI using a Genetic Algorithm by Bai Li, May 2011 <https://luckytoilet.wordpress.com/2011/05/27/coding-a-tetris-ai-using-a-genetic-algorithm/>

((Applying Artificial Intelligence to Nintendo Tetris by MeatFighter, January 2014 <http://meatfighter.com/nintendotetrisai/>))

Tetris Artificial Intelligence by Tsai Wei-Tze, Yen Chi-Hsien, Ma Wei-Chiu, Yu Tian-Li, December 2013  
<https://web.engr.illinois.edu/~cyen4/pdf/Tetris_AI.pdf>

Temporal Differences-Based Policy Iteration and Applications in Neuro-Dynamic Programming by Dimitri P. Bertsekas and Sergey Ioffe, August 1997 <http://web.mit.edu/dimitrib/www/Tempdif.pdf>