

## Non-missile penetrating underground concrete structures using cellular automata learning algorithms

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**Abstract:** One of the problems of underground concrete structures is Penetration and targeting of Air-to-ground missiles in the deep Earth. This problem causes irreparable damage to the body of a country's substructure. In this article have tried to focus on Strength and resistance of soil accumulation on structures to prevent the infiltration of missile types, instead on its concrete structure. So that the missile hits the primary layer of the soil then the soil gets high density and control high temperature of missiles and largely prevented from reaching of the missile to the main structure. This practice and improvement of soil productivity are concluded in laboratories using Nano Science and IT that can help to build these structures. Finally, you are seen as a high-density liquid that is prevented from exploding and destroying the missile.

**Key words:** Non-missile; Concrete; Cellular Automata

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### 1. Introduction

14-ton GBU-57A/B missile is a guided trench-breaker of America air force which is known for bomb trench breaker; this bomb is so much bigger and destructive than its counterparts which have only 2 ton. The bomb has been tested in several operations in different countries. It is like a bullet can breaks security defenses and destroys target at a depth of 60 meters below the earth. This giant bomb in the length of 6 m and a diameter of one meter is fired by fighter jets of "B - 52" and "B - 2".

These two military aircrafts, built for America's strategic missiles. This bomb in addition to shatter of the protective walls causes earthquake which is destroy target.

Accordingly if the target is within 100 meters of underground, this earthquake still can damage target. Now we should search for ways to prevent and neutralize the bomb. This paper presents a method to combat this bomb.

Weight of this bomb is 13 ½ tons which consist of 2,500 kilograms of explosives with the features of very high-intensity explosion. It could be destroy in depth establishments and warehouses containing chemical weapons, biological, nuclear or missile. This bomb is now within The U.S. Department of Defense. In addition to its abilities that have been mentioned in the text, there are some weaknesses. This case is about all the weapons and each weapon has its advantages and disadvantages. The disadvantage of this weapon is capable of launching only by the B-52 and B-2 bombers and the large size of it. To better understand, these two weaknesses

can examine in the use of this bomb against uranium enrichment establishment. About first weaknesses (limitations launchers) it should be noted that the choice between B-52 and B-2, B-52 aircraft has a radar cross section and has a surface area of 0.1 m obviously, because of massive radar and air defense systems deployed around the facility using B-52 aircraft due to its high radar cross section far from mind. Aircraft that has very small cross section stays in the air. Using of this aircraft depends on the outline of the mission and no doubt before the arrival of the aircraft to air, the defense and fighter planes should be suppressed or disrupted. Because the cost of getting hit, could even lead to retire of its expensive fleet. Also because of its huge size (length 6.2 m, diameter 80 cm and weighs 30 thousand pounds!) As it is released at high altitude, anti-aircraft missiles and radar systems can intercept before dealing with the facility. For example, the Tor-M1 system has the ability to engage easily and quickly destroy it after throwing the bomb. This weapon has been tested once and the simulation will continue until the end of 2012. Even if the bombs hit the facility cannot be said with certainty that these facilities are gone. Now we're trying to minimize the damage resulting from it.

### 2. History of research

Nuclear weapons North Korea has attracted international attention for several years. In the early 1960s, domestic and international political factors in Pyongyang to seek indigenous capability to produce advanced weapons systems, including rockets and missiles. However, North Korea is actively seeking foreign technology helping, especially from China

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and the Soviet Union to develop its missile capabilities. North Korea has now become one of the leading exporters of missiles, in other regions of the world. It has analyses many ways to destroy of missiles fired.

**2.1. Method of problem**

**2.1.1. Cellular Automata**

Cellular automata are model for systems in which simple multi-component working together to create complex patterns. Space of cellular automata includes of a regular grid of cells, each cell consists of a finite state automaton with (Finite state automaton), and take different value ( $K > 1$ ). Cellular automata cells can updated at the same time and in accordance with the law of local transmission (Local transition rule) are called  $\Phi$  during which each cell value is determined based on the values of neighboring cells. Regarding the use of cellular automata in different fields, each provides a definition of CA.

Following the definition of two-dimensional cellular automata is presented:

Two-dimensional cellular automata are discrete dynamical systems that consist of limited ( $r \times c$ ) cells, which are identical in the two dimensional cellular space. Each cell has a finite state set of  $Q$  which changes at each time according to the local transmission-mode.

In other words, the state of a cell depends on its state and neighboring cells at time  $t - 1$ . CA is more accurately defined by four components ( $C, Q, V, f$ )

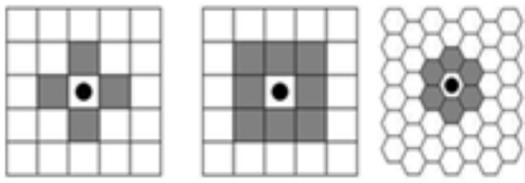


Fig 1: Cells location in Cellular Automata

**2.1.2. Nanotechnology**

Nanotechnology or nanotech is a field of applied science and technology that covering a broad queries. Also it inhibits matter or devices with dimensions less than one micrometer, normally 1 to 100 nanometers.

Nanotechnology is the application of new properties of materials and systems at the scale of the new physics effects - mainly due to the dominance of quantum effects on the classical properties. Nanotechnology is a highly interdisciplinary science which is related to engineering fields, such as food, medicine, pharmacy and drug design, veterinary medicine, biology, applied physics, semiconductor devices, macromolecule chemistry and mechanical, electrical and chemical engineering. Analysts believe that

nanotechnology, biotechnology (Biotechnology) and information technology (IT) are the three kingdoms of the Third Industrial Revolution.

**3. Methodology**

Due to the sensitivity of the trench breaker bomb penetrated into underground trenches, bins should be used to control and steer the bomb, For this purpose, the structure of cellular automata used to keep under control the entire region; upon a change in a cell, adjacent cells are also engaged and trying to reduce damage. Liquid is made in the upper layer of earth at a height of 60 meters and a height of 40 meters. The Soil properties to a height of 40 m can be soil compaction and several other items that can be studied in soil mechanics laboratory.

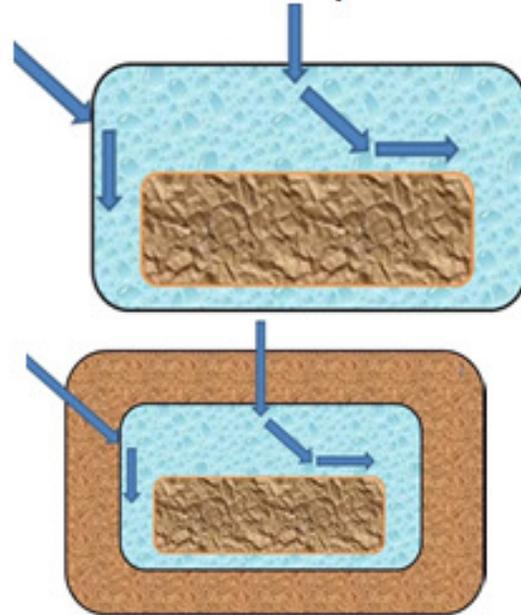


Fig. 2: Problem visualization

But the synthetic fluid should have the following properties:

High refractive index, low temperature, high density, and several other items that will be investigated in the Nano lab.

Whole set of motion sensors operate in separate cells; So that with the smallest change in the size and density of soil, sensors worked and all adjacent cells come into standby mode.

Cells operating environment are seen in the picture:

$\Delta\theta$  .speed

$\Delta h$  .temperature

$\Delta\phi$  .size

$\Delta\partial$  .time

These items are identified in the trench breakers bomb that should be investigated, above this point, the items containing the soil to a depth of 40 meters and synthetic fluid deep into 60 meters.

$\Delta t$  .Temperature

$\Delta\rho$  .density

$\Delta\tau$  .density of the fluid

$\Delta\lambda$  .soil compaction

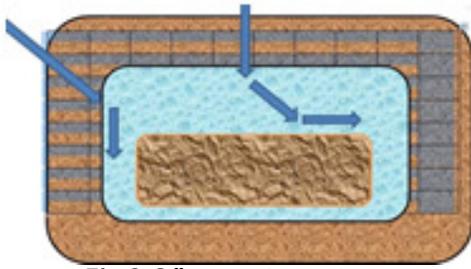
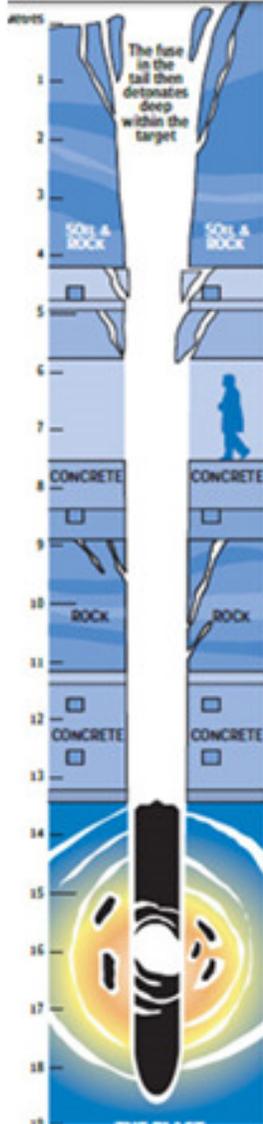


Fig. 3: Cells operating environment



$$\Delta\theta + \Delta\delta + \Delta h + \Delta\phi + \Delta\lambda = \beta$$

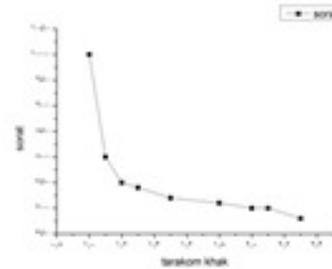


Fig. 4: Results of the study

The firing process in this case is that after firing bombs, fighter type emits "energy laser" that reflecting surface of the target Bomb enter cone "reflected energy" and is looking the most densely-"laser", then attacks toward the target. The bomb breaker, combine its rigidity and strength to penetrate into the surface and before the explosion is about 200 feet into the earth then the "delay fuse" that is behind the bombs, will explode warheads at a depth of sixty meters. With the existence of laser tracking to identify the most crowded spot on the target, A few tricks can be used but the most important and most effective is anti-laser material that can be equipped highest point of the liquid wit this material. This material is now available Other important factors must also be evaluated. This is done primarily in a laboratory setting. In this research has also been used of the automaton. It is better that Cellular automata are used in a liquid environment For software implementation used cellular learning algorithms. The algorithm should be carefully studied to examine the influence of neighboring cells.

#### 4. Conclusion

Depending on the speed and accuracy of the missile, referred to in Article use of fluids that are made by a Nano science can help in diverting and destroy the missiles before they reach the target. Due to the presence of enemies and keep a lot of information, and industrial and military infrastructure, carried out and implementation of these projects will help to maintain the Projects.

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