NAANMUDHALVAN ASSIGNMENT— DIGITAL MARKETING

NAME: R.VAISHALI

ROLL NO: 2014039

Email id:vaishaliravichandran01@gmail.com

NMID: B2E1E1FE373D5CAADDE4EB495483258B

1.Create a blog or website using Blogspot and Wordpress .Customize the theme design and post new article with 500 words.

BLOGSPOT:

LINK: https://vaishalitechnicalfacts.blogspot.com/?m=1 vaishalitechnicalfacts.blogspot.com/2023/10/semiconductor.html?m=1

vaishalitechinalfacts

Home

Sunday, 8 October 2023

SEMICONDUCTOR

SEMICONDUCTORS:

Semiconductor is a substance which has resitivity in between conductors and insulators.The resitivity of a semiconductor is less than an insulator but more than a conductor.The resistance of a semiconductor is inversely proportional to the temperature . When a suitable impurity is added to a semiconductor , its current conductivity properties change appreciably.

TYPES OF SEMICONDUCTOR:

Semiconductors can be classified into two types :

1.INTRINSIC SEMICONDUCTOR OF PURE OF SEMICONDUCTORS

2.EXTRINSIC SEMICONDUCTOR OR IMPURE OF SEMICONDUCTORS

INTRINSIC SEMICONDUCTOR:

The normal (pure) silicon and Germanium are intrinsic semiconductor . They possess all essential conducting characteristics of a semiconductor .The number of electrons present in the outermost orbit of intrinsic semiconductor is four, hence ,they are termed as tetra valent.So, intrinsic semiconductors are tetra valent in nature.

EXTRINSIC SEMICONDUCTOR:

The process of adding impurities to an intrinsic semiconductors is known as Doping.With respect to the type of impurity

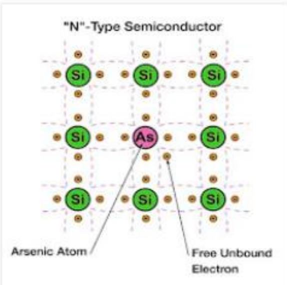
EXTRINSIC SEMICONDUCTOR:

The process of adding impurities to an intrinsic semiconductors is known as Doping.With respect to the type of impurity added,extrinsic semiconductors are classified into two types.

1.N-TYPE Semiconductors

2.P-TYPE Semiconductors

N-TYPE SEMICONDUCTORS:

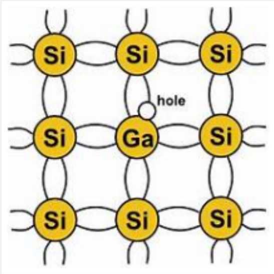


When a small amount of pentavalent impurity (eg: Antimony,Arsenic) is added to a pure semiconductor, it is known as N-type semiconductor.The addition of pentavalent impurity gives a large number of free electrons in the semiconductors crystal.The four electrons of intrinsic semiconductor bonds with the four electrons of pentavalent impurity and an extra fifth electron is unbounded and free.The Majority carriers in N-Type are electrons (Negative charges) and Minority carriers are holes (positive charges).N-Type semiconductors are known as Donor impurities because they donate free electrons to the semiconductor crystal.

P-TYPE SEMICONDUCTORS:

semiconductors are known as Donor impurities because they donate free electrons to the semiconductor crystal.

P-TYPE SEMICONDUCTORS:



When a small amount of Trivalent impurity (eg: Indium,Gallium) is added to a pure semiconductor, it is known as P-type semiconductor.The addition of trivalent impurity gives a large number of holes in the semiconductors crystal.The four electrons of intrinsic semiconductor bonds with the three electrons of trivalent impurity and one hole is created.The Majority carriers in P-Type are holes (positive charges)and Minority carriers are electrons (negative charges).P-Type semiconductors are known as Acceptor impurities because the holes created can accept the electrons.

P-Njunction:

A p-type material consists of silicon atoms and trivalent impurity atoms such as boron.

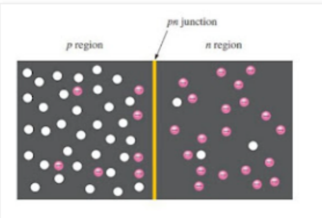
The boron atom adds a hole when it bonds with the silicon atoms. However, since the number of protons and the number of electrons are equal throughout the material, there is no net charge in the material and so it is neutral.

An n-type silicon material consists of silicon atoms and pentavalent atoms such as antimony.

An impurity atom releases an electron when it bonds with four silicon atoms. Since there is still an equal number of protons and electrons (including the free electrons) throughout the material, there is no net charge in the material and so it is neutral.

The p region has many holes (majority carriers) from the impurity atoms and only a few thermally generated free electrons (minority carriers).

The n region has many free electrons (majority carriers) from the impurity atoms and only a few thermally generated holes (minority carriers).



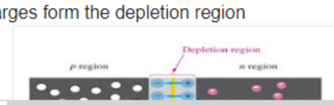
The free electrons in the n region are randomly drifting in all directions.

At the instant of the pn junction formation,the free electrons near the junction in the n region begin to diffuse across the junction into the p region where they combine with holes near the junction.

When the pn junction is formed, the n region loses free electrons as they diffuse across the junction.This creates a layer of positive charges (pentavalent ions) near the junction.

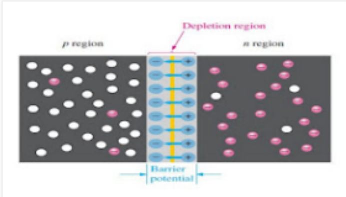
As the electrons move across the junction, the p region loses holes as the electrons and holes combine. This creates a layer of negative charges (trivalent ions) near the junction.

These two layers of positive and negative charges form the depletion region



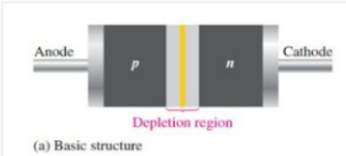
As the electrons move across the junction, the p region loses holes as the electrons and holes combine. This creates a layer of negative charges (trivalent ions) near the junction.

These two layers of positive and negative charges form the depletion region



PN JUNCTION DIODE:

The p region is called the anode and is connected to a conductive terminal. The n region is called the cathode and is connected to a second conductive terminal.



(a) Basic structure

(b) Symbol

(b) Symbol

FORWARD BIASED CONDITION:

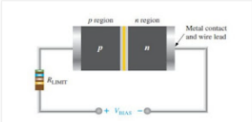
An external voltage is applied to cause the diode to conduct current in one direction and block it in the other direction. This process is called biasing.

Forward bias is the condition that allows current through the pn junction.

The external bias voltage is designated as **VBIAS**. The resistor limits the forward current to a value that will not damage the diode.

The negative side of **VBIAS** is connected to the n region of the diode and the positive side is connected to the p region.

Another requirement is that the bias voltage, VBIAS, must be greater than the barrier potential.



The electrons are present in the valence band in the p region. The Positive side of the bias-voltage is applied to the anode or p region.

Since unlike charges attract, the positive side of the bias-voltage source attracts the valence electrons toward the left end of the p region.

The holes in the p region provide the medium or "pathway" for these valence electrons to move through the p region.

The valence electrons move from one hole to the next toward the left.

The valence electrons move from one hole to the next toward the left.

The holes, which are the majority carriers in the p region, effectively (not actually) move to the right toward the junction.

This effective flow of holes is the hole current.

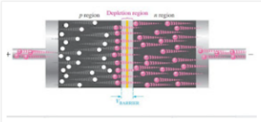
As the electrons flow out of the p region through the external connection (conductor) and to the positive side of the bias-voltage source, they leave holes behind in the p region.

At the same time, these electrons become conduction electrons in the metal conductor.

Electrons diffuse into the depletion region from n region due to the repulsive force of the negative side of battery connected to n region.

As more electrons flow into the depletion region, the number of positive ions is reduced.

As more holes effectively flow into the depletion region on the other side of the pn junction, the number of negative ions is reduced. This reduction in positive and negative ions during forward bias causes the depletion region to narrow, and current conduction occurs.



REVERSE BIASED CONDITION:

Reverse bias is the condition that essentially prevents current through the diode.

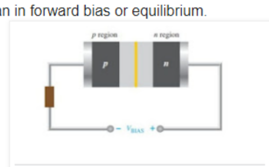
vaishalitechnicalfacts.blogspot.com/2023/10/semiconductor.html?m=1

Reverse bias is the condition that essentially prevents current through the diode.

Figure below shows a dc voltage source connected across a diode in the direction to produce reverse bias. This external bias voltage is designated as VBIAS.

The positive side of VBIAS is connected to the n region of the diode and the negative side is connected to the p region.

The depletion region is shown much wider than in forward bias or equilibrium.



The positive side of the bias-voltage source "pulls" the free electrons, which are the majority carriers in the n region, away from the pn junction.

As the electrons flow toward the positive side of the voltage source, additional positive ions are created. This results in a widening of the depletion region and a depletion of majority carriers.

In the p region, electrons from the negative side of the voltage source enter as valence electrons and move from hole to hole toward the depletion region where they create additional negative ions.

Reverse bias voltage results in widening of the depletion region and a depletion of majority carriers and current conduction is blocked.

WORDPRESS:

LINK: https://vaishaliravichandran1.wordpress.com/

SEMICONDUCTORS

October 19, 2023

SEMICONDUCTORS:

Semiconductor is a substance which has resitivity in between conductors and insulators.The resitivity of a semiconductor is less than an insulator but more than a conductor.The resistance of a semiconductor is inversely proportional to the temperature . When a suitable impurity is added to a semiconductor , its current conductivity properties change appreciably.

TYPES OF SEMICONDUCTOR:

Semiconductors can be classified into two types :

conductivity properties change appreciably.

TYPES OF SEMICONDUCTOR:

Semiconductors can be classified into two types :

1.INTRINSIC SEMICONDUCTOR OF PURE OF SEMICONDUCTORS

2.EXTRINSIC SEMICONDUCTOR OR IMPURE OF SEMICONDUCTORS

INTRINSIC SEMICONDUCTOR:

The normal (pure) silicon and Germanium are intrinsic semiconductor . They possess all essential conducting characteristics of a semiconductor .The number of electrons present in the outermost orbit of intrinsic semiconductor is four, hence ,they are termed as tetra valent.So, intrinsic semiconductors are tetra valent in nature.

EXTRINSIC SEMICONDUCTOR:

vaishaliravichandran1.wordpress.com/2023/10/19/semiconductors/

Design a site like this with WordPress.com Get started

About

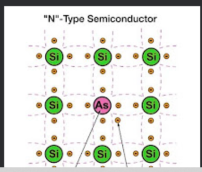
EXTRINSIC SEMICONDUCTOR:

The process of adding impurities to an intrinsic semiconductors is known as Doping.With respect to the type of impurity added,extrinsic semiconductors are classified into two types.

1.N-TYPE Semiconductors

2.P-TYPE Semiconductors

N-TYPE SEMICONDUCTORS:



Comment Follow

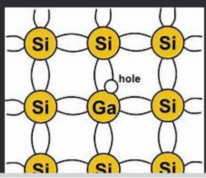
vaishaliravichandran1.wordpress.com/2023/10/19/semiconductors/

Design a site like this with WordPress.com Get started

About

When a small amount of pentavalent impurity (eg: Antimony,Arsenic) is added to a pure semiconductor, it is known as N-type semiconductor.The addition of pentavalent impurity gives a large number of free electrons in the semiconductors crystal.The four electrons of intrinsic semiconductor bonds with the four electrons of pentavalent impurity and an extra fifth electron is unbounded and free.The Majority carriers in N-Type are electrons (Negative charges) and Minority carriers are holes (positive charges).N-Type semiconductors are known as Donor impurities because they donate free electrons to the semiconductor crystal.

P-TYPE SEMICONDUCTORS:



Comment Follow

When a small amount of Trivalent impurity (eg: Indium,Gallium) is added to a pure semiconductor, it is known as P-type semiconductor.The addition of trivalent impurity gives a large number of holes in the semiconductors crystal.The four electrons of intrinsic semiconductor bonds with the three electrons of trivalent impurity and one hole is created.The Majority carriers in P-Type are holes (positive charges)and Minority carriers are electrons (negative charges).P-Type semiconductors are known as Acceptor impurities because the holes created can accept the electrons.

P-Njunction:

A p-type material consists of silicon atoms and trivalent impurity atoms such as boron.

The boron atom adds a hole when it bonds with the silicon atoms. However, since the number of protons and the number of electrons are equal throughout the material, there is no net charge in the material and so it is neutral.

vaishaliravichandran1.wordpress.com/2023/10/19/semiconductors/
Design a site like this with WordPress.com Get started
About
there is no net charge in the material and so it is neutral.

An n-type silicon material consists of silicon atoms and pentavalent atoms such as antimony.

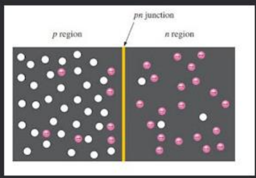
An impurity atom releases an electron when it bonds with four silicon atoms. Since there is still an equal number of protons and electrons (including the free electrons) throughout the material, there is no net charge in the material and so it is neutral.

If a piece of intrinsic silicon is doped so that part is n-type and the other part is p-type, a pn junction forms at the boundary between the two regions and a diode is created.

The p region has many holes (majority carriers) from the impurity atoms and only a few thermally generated free electrons (minority carriers).

The n region has many free electrons (majority carriers) from the impurity atoms and only a few thermally generated holes (minority carriers).

only a few thermally generated holes (minority carriers).



The free electrons in the n region are randomly drifting in all

directions.

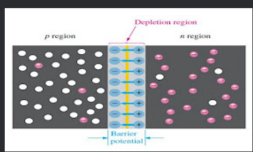
At the instant of the pn junction formation,the free electrons near the junction in the n region begin to diffuse across the junction into the p region where they combine with holes near the junction.

When the pn junction is formed, the n region loses free electrons as they diffuse

When the pn junction is formed, the n region loses free electrons as they diffuse
across the junction.This creates a layer of positive charges (pentavalent ions) near the junction.

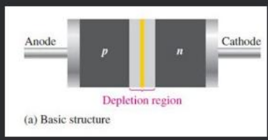
As the electrons move across the junction, the p region loses holes as the electrons and holes combine. This creates a layer of negative charges (trivalent ions) near the junction.

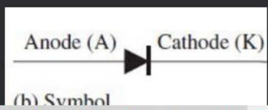
These two layers of positive and negative charges form the depletion region



PN JUNCTION DIODE:

The p region is called the anode and is connected to a conductive terminal. The n region is called the cathode and is connected to a second conductive terminal.





About

FORWARD BIASED CONDITION:

An external voltage is applied to cause the diode to conduct current in one direction and block it in the other direction. This process is called biasing.

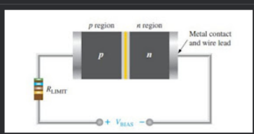
Forward bias is the condition that allows current through the pn junction.

The external bias voltage is designated as **VBIAS**. The resistor limits the forward current to a value that will not damage the diode.

The negative side of **VBIAS** is connected to the n region of the diode and the positive side is connected to the p region.

Another requirement is that the bias voltage, VBIAS, must be greater than the barrier potential.

vaishaliravichandran1.wordpress.com/2023/10/19/semiconductors/
Design a site like this with WordPress.com
Get started
About



The electrons are present in the valence band in the p region. The Positive side of the bias-voltage is applied to the anode or p region.

Since unlike charges attract, the positive side of the bias-voltage source attracts the valence electrons toward the left end of the p region.

The holes in the p region provide the medium or "pathway" for these valence electrons to move through the p region.

The valence electrons move from one hole to the next toward the left.

The holes, which are the majority carriers in the p region, effectively (not actually)

The holes, which are the majority carriers in the p region, effectively (not actually) move to the right toward the junction.

This effective flow of holes is the hole current.

As the electrons flow out of the p region through the external connection (conductor) and to the positive side of the bias-voltage source, they leave holes behind in the p region.

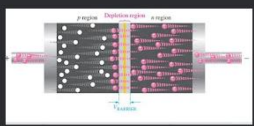
At the same time, these electrons become conduction electrons in the metal conductor.

Electrons diffuse into the depletion region from n region due to the repulsive force of the negative side of battery connected to n region.

As more electrons flow into the depletion region, the number of positive

ions is reduced.

As more holes effectively flow into the depletion region on the other side of the pn junction, the number of negative ions is reduced. This reduction in positive and negative ions during forward bias causes the depletion region to narrow, and current conduction occurs.



REVERSE BIASED CONDITION:

Reverse bias is the condition that essentially prevents current through the

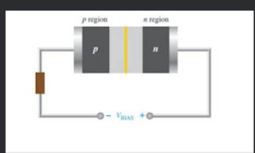
diode.

Figure below shows a dc voltage source connected across a diode in the

Figure below shows a dc voltage source connected across a diode in the direction to produce reverse bias. This external bias voltage is designated as VBIAS.

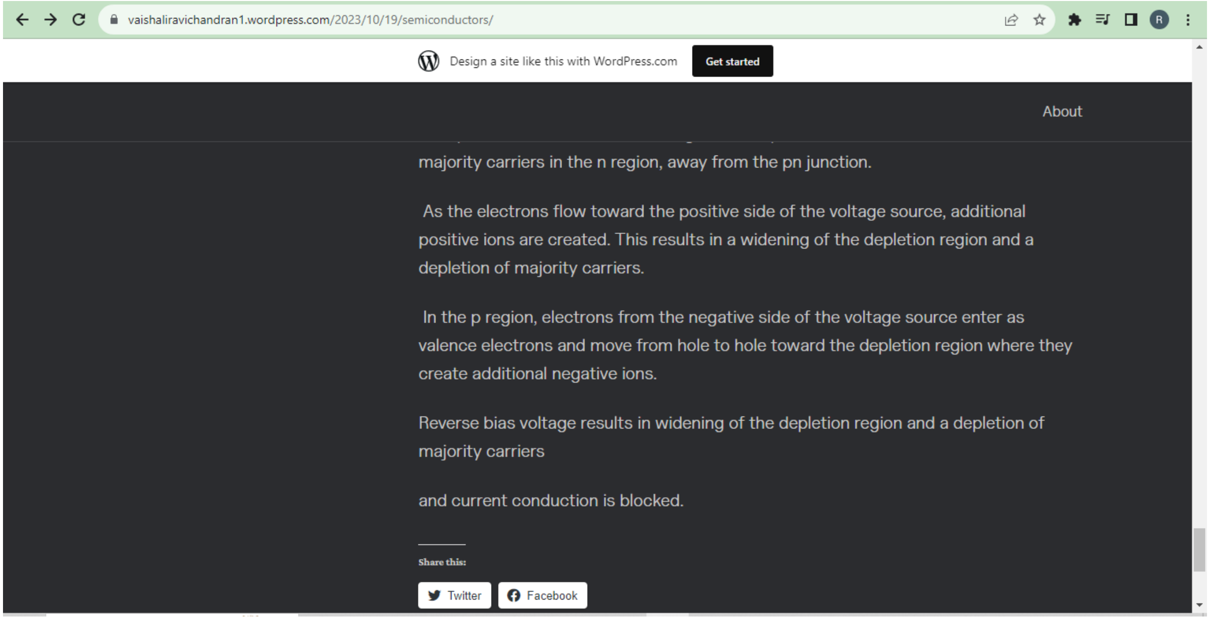
The positive side of VBIAS is connected to the n region of the diode and the negative side is connected to the p region.

The depletion region is shown much wider than in forward bias or equilibrium.



The positive side of the bias-voltage source "pulls" the free electrons, which are the majority carriers in the n region, away from the pn junction.

As the electrons flow toward the positive side of the voltage source, additional



2.Create a New Business facebook page and post one social media poster for your brand.

LINK: https://m.facebook.com/story.php?story_fbid=pfbid02Xk6Vmoeg8WWVwB45eFBvvaBGXY6Ccc7WDX9AAVvamJpaWG6xAozeUhrdxY7fwC7Yl&id=61552205537912&mibextid=Nif5oz

4G 12:23

Posts About Photos More

Technical facts

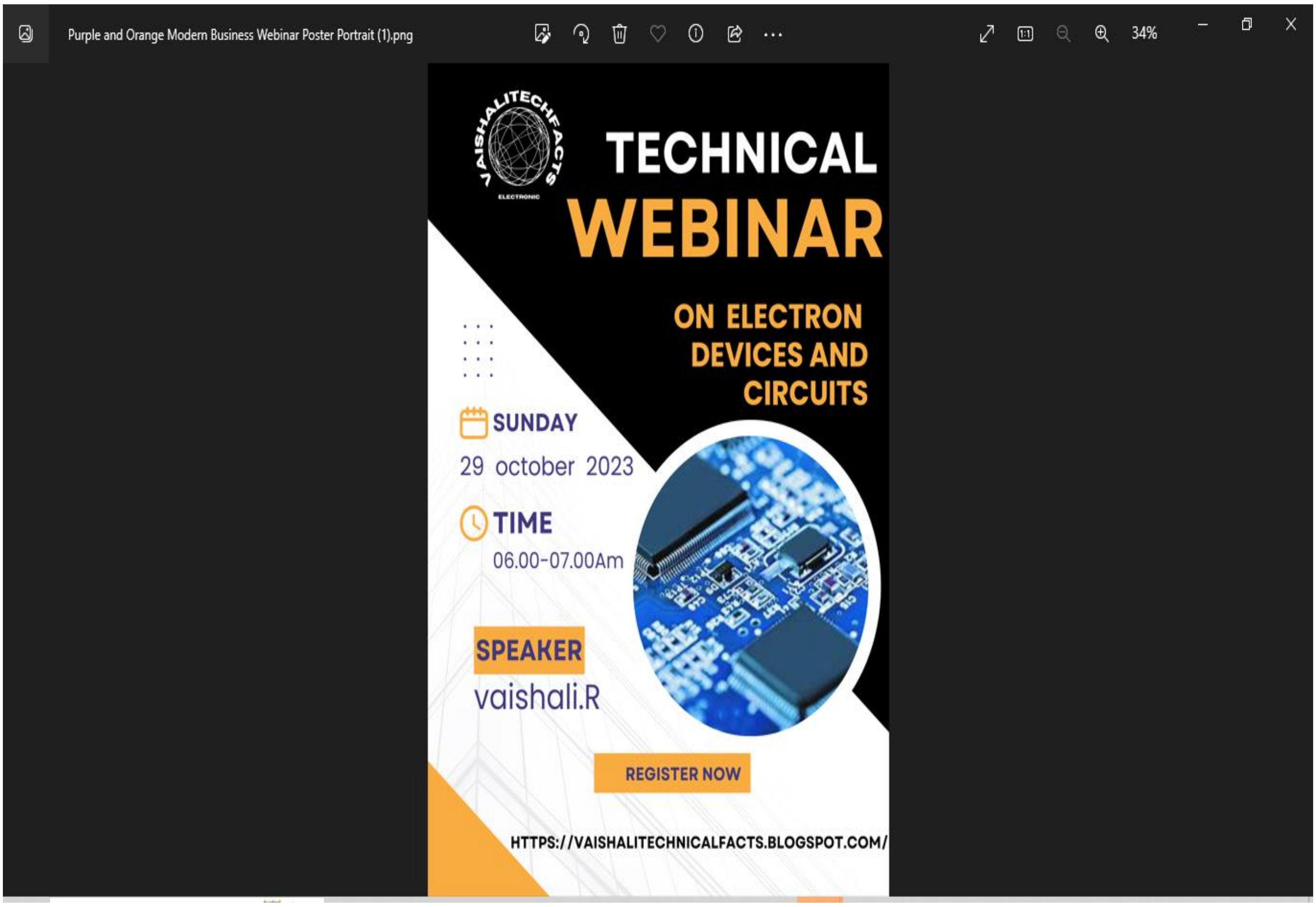
Just now ·

You can see technical facts on Electronics and communication engineering ... See more

See insights and ads

Boost post

3.Create and design a social media advertisement poster using canva



4.Create email newsletter design using MailChimp or canva tool.

NEWS LETTER

ROBOT ROCYCLE

ISSUE 5 | 07/11/2023

WORKING

THE ROBOT, CALLED ROCYCLE, USES CAPACITIVE SENSORS IN ITS TWO PINCERS TO SENSE THE SIZE AND STIFFNESS OF THE MATERIALS IT HANDLES.THIS ALLOWS IT TO DISTINGUISH BETWEEN DIFFERENT METAL, PLASTIC AND PAPER OBJECTS. IN A MOCK RECYCLING-PLANT SETUP, WITH OBJECTS PASSING ON A CONVEYOR, ROCYCLE CORRECTLY CLASSIFIED 27 OBJECTS WITH 85 PER CENT ACCURACY.

APPLICATIONS

THE CREATORS BELIEVE THAT SUCH ROBOTS COULD BE USED IN PLACES LIKE APARTMENT BLOCKS OR ON UNIVERSITY CAMPUSES TO CARRY OUT FIRST-PASS SORTING OF PEOPLE'S RECYCLING, CUTTING DOWN ON CONTAMINATION.

INVENTION

Scientists at Computer Science and Artificial Intelligence Lab at Massachusetts Institute of Technology (MIT) have developed a robot arm with soft grippers that picks up objects from a conveyor belt and identifies what these are made from by touch.

DISADVANTAGE

SINCE THE ROBOT PICKS UP ITEMS ONE BY ONE, IT IS TOO SLOW FOR INDUSTRIAL RECYCLING PLANTS, WHICH ARE EXPENSIVE TO RUN AND NEED TO PROCESS WASTE QUICKLY TO COVER COSTS.