Collected papers of

Lord Soumadeep Ghosh

Volume 13

The mathematics of area occupation

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the mathematics of area occupation. The paper ends with ”The End”

Introduction

The mathematics of area occupation was known since the Third Reich of the germane economy, but this knowledge was kept secret for many decades. In this paper, I describe the mathematics of area occupation.

The mathematics of area occupation

We have the invading state with area A and the invaded state with area a at $t = 0$.

The area occupied by the invading state at the loss of the invaded state is o by time $t = T$.

Then we have the following equations:

$$\frac{A+o}{A} = 1 + RT$$

$$\frac{a-o}{a} = 1 + rT$$

$$\frac{A+o}{A} = 1 + R_f + p_O$$

$$\frac{a-o}{a} = 1 + r_f - p_O$$

where

R is the rate of occupation by the invading state

r is the rate of area loss by the invaded state

R_f is the risk-free rate of the invading state

r_f is the risk-free rate of the invaded state

$p_O > 0$ is the **occupation premium**

Eliminating A, a, o between the four equations gives us two equations:

$$r_f = p_O + rT$$

$$R_f = RT - p_O$$

which can be solved for

$$p_O = \frac{r_f R - R_F r}{R + r}$$

and

$$T = \frac{R_f + r_f}{r + R}$$

Notes

1. Note that the occupation premium p_O is independent of areas A, a and o.
2. Note that the time to occupation T is independent of areas A, a and o.
3. Note that we can alternatively eliminate p_O and T to obtain equations that can be solved for A, a and o, which are independent of p_O and T.

The End

14 solutions to the mathematics of area occupation

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe 14 solutions to the mathematics of area occupation. The paper ends with "The End"

Introduction

In a previous paper, I've described the mathematics of area occupation. In this paper, I describe 14 solutions to the mathematics of area occupation.

14 solutions to the mathematics of area occupation

1. $$A = 9, a = 9, o = 18, R = -10, r = 10, T = -\frac{1}{5}, R_f = -97, r_f = 97, p_O = 99$$

2. $$A = 47, a = 80, o = 22, R = 38, r = -\frac{893}{40}, T = \frac{11}{893}, R_f = -36, r_f = \frac{68043}{1880}, p_O = \frac{1714}{47}$$

3. $$A = 360, a = 23, o = 68, R = -8, r = \frac{2880}{23}, T = -\frac{17}{720}, R_f = -69, r_f = \frac{137101}{2070}, p_O = \frac{6227}{90}$$

4. $$A = 390, a = 20, o = 40, R = -82, r = 1599, T = -\frac{2}{1599}, R_f = -32, r_f = \frac{1174}{39}, p_O = \frac{1252}{39}$$

5. $$A = 603, a = 90, o = 59, R = -67, r = \frac{4489}{10}, T = -\frac{59}{40401}, R_f = -6, r_f = \frac{10939}{2010}, p_O = \frac{3677}{603}$$

6. $$A = 632, a = 81, o = 43, R = 55, r = -\frac{34760}{81}, T = \frac{43}{34760}, R_f = -15, r_f = \frac{744187}{51192}, p_O = \frac{9523}{632}$$

7. $$A = 930, a = 96, o = 43, R = -99, r = \frac{15345}{16}, T = -\frac{43}{92070}, R_f = -2, r_f = \frac{23783}{14880}, p_O = \frac{1903}{930}$$

8.

$$A = 953, a = 25, o = 68, R = 75, r = -2859, T = \frac{68}{71475}, R_f = -33, r_f = \frac{723121}{23825}, p_O = \frac{31517}{953}$$

9.

$$A = 957, a = 31, o = 99, R = 51, r = -\frac{48807}{31}, T = \frac{1}{493}, R_f = -18, r_f = \frac{13404}{899}, p_O = \frac{525}{29}$$

10.

$$A = 977, a = 98, o = 26, R = -69, r = \frac{67413}{98}, T = -\frac{26}{67413}, R_f = -20, r_f = \frac{946033}{47873}, p_O = \frac{19566}{977}$$

11.

$$A = 1007, a = 72, o = 80, R = -63, r = \frac{7049}{8}, T = -\frac{80}{63441}, R_f = -11, r_f = \frac{90343}{9063}, p_O = \frac{11157}{1007}$$

12.

$$A = 1039, a = 15, o = 38, R = -79, r = \frac{82081}{15}, T = -\frac{38}{82081}, R_f = -83, r_f = \frac{1254643}{15585}, p_O = \frac{86275}{1039}$$

13.

$$A = 1153, a = 60, o = 82, R = 4, r = -\frac{1153}{15}, T = \frac{41}{2306}, R_f = -89, r_f = \frac{3033697}{34590}, p_O = \frac{102699}{1153}$$

14.

$$A = 1295, a = 30, o = 79, R = 22, r = -\frac{2849}{3}, T = \frac{79}{28490}, R_f = -62, r_f = \frac{461753}{7770}, p_O = \frac{80369}{1295}$$

The End

14 solutions of the devil to the mathematics of area occupation

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe 14 solutions of the devil to the mathematics of area occupation. The paper ends with "The End"

Introduction

In a previous paper, I've described the mathematics of area occupation. In this paper, I describe 14 solutions of the devil to the mathematics of area occupation.

14 solutions of the devil to the mathematics of area occupation

1.

$$A = 666, a = 12, o = 0, R = 0, r = 83, T = 0, R_f = 0, r_f = 0, p_O = 0$$

2.

$$A = 666, a = 48, o = 0, R = -67, r = \frac{29}{10}, T = 0, R_f = 0, r_f = 0, p_O = 0$$

3.

$$A = 666, a = 127, o = 0, R = 0, r = 0, T = \frac{31}{10}, R_f = -63, r_f = 63, p_O = 63$$

4.

$$A = 666, a = 213, o = 0, R = 0, r = 85, T = 0, R_f = 0, r_f = 0, p_O = 0$$

5.

$$A = 666, a = 252, o = 0, R = 0, r = 86, T = 0, R_f = -49, r_f = 49, p_O = 49$$

6.

$$A = 666, a = 606, o = 0, R = 0, r = 0, T = -\frac{37}{10}, R_f = -82, r_f = 82, p_O = 82$$

7.

$$A = 666, a = 612, o = 0, R = 101, r = -\frac{41}{10}, T = 0, R_f = 0, r_f = 0, p_O = 0$$

8.

$$A = 666, a = 779, o = 0, R = 0, r = 35, T = 0, R_f = -64, r_f = 64, p_O = 64$$

9.

$$A = 666, a = 796, o = 0, R = 70, r = \frac{39}{10}, T = 0, R_f = -72, r_f = 72, p_O = 72$$

10.

$$A = 666, a = 930, o = 0, R = -6, r = \frac{3}{5}, T = 0, R_f = 0, r_f = 0, p_O = 0$$

11.

$$A = 666, a = 979, o = 0, R = 0, r = 0, T = -\frac{7}{2}, R_f = 0, r_f = 0, p_O = 0$$

12.

$$A = 666, a = 1116, o = 0, R = 6, r = \frac{29}{10}, T = 0, R_f = 0, r_f = 0, p_O = 0$$

13.

$$A = 666, a = 1142, o = 0, R = 3, r = -5, T = 0, R_f = -82, r_f = 82, p_O = 82$$

14.

$$A = 666, a = 1303, o = 0, R = 0, r = 27, T = 0, R_f = -74, r_f = 74, p_O = 74$$

The End

Why Indo-Swiss military-fiscal co-operation is the need of this decade

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe why Indo-Swiss military-fiscal co-operation is the need of this decade. The paper ends with "The End"

Introduction

In a previous paper, I've described why India and Switzerland cannot remain neutral in World War 3. In this paper, I describe why Indo-Swiss military-fiscal co-operation is the need of this decade.

Why Indo-Swiss military-fiscal co-operation is the need of this decade

The hey-days of the LIBOR trade are behind us. As of this writing, Russia has invaded Ukraine and there is turmoil in Europe from rising energy prices. Few European nations are in a position to leverage this fact into profit and growth - Switzerland is one of a very few of them.

Switzerland has a healthy central bank balance sheet and low but positive bank interest rate. In the coming decade, Switzerland will need higher returns on Swiss capital and India has a moderate bank interest rate that offers higher returns but not much risk. A large arbitrage opportunity exists and thus, the need for fiscal co-operation is clear.

The terrain of both India and Switzerland offer geopolitical choke-points that will decide the logistics of World War 3 and thus, both India and Switzerland will need to issue war bonds to finance defense spending during World War 3. Large mountains exist and thus, the need for military co-operation is clear.

The End

The mathematics of growth and collapse of a heavenly body

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the mathematics of growth and collapse of a heavenly body. The paper ends with "The End"

Introduction

There is a mathematics of growth and collapse of a heavenly body. In this paper, I describe the mathematics of growth and collapse of a heavenly body.

Fundamental concepts

The mathematics of growth and collapse of a heavenly body deals with 6 concepts:

1. The **size** $S(t)$ of the heavenly body as a function of time.
2. The **probability of collapse** $0 \leq c(t) \leq 1$ of the heavenly body as a function of time.
3. The **rate of growth before collapse** $g(t)$ of the heavenly body as a function of time.
4. The **observable rate of growth** $o(t)$ of the heavenly body as a function of time.
5. The **risk-free rate** $r_f(t)$ of the heavenly body as a function of time.
6. The **body risk premium** $p_{br}(t)$ on the heavenly body as a function of time.

The equations of growth and collapse of a heavenly body

1. $$\frac{S(t+1)}{S(t)} = (1 - c(t))(1 + g(t))$$

2. $$\frac{S(t+1)}{S(t)} = 1 + o(t)$$

3. $$\frac{S(t+1)}{S(t)} = 1 + r_f(t) + p_{br}(t)$$

The divine insight

The divine insight is that we can eliminate $S(t)$, $S(t{+}1)$ and $o(t)$ from the three equations above to obtain

$$c(t) = \frac{g(t) - r_f(t) - p_b(t)}{1 + g(t)}$$

The End

The positions of the 14 capitals on a spherical planet of 1 radius

Soumadeep Ghosh

Kolkata, India

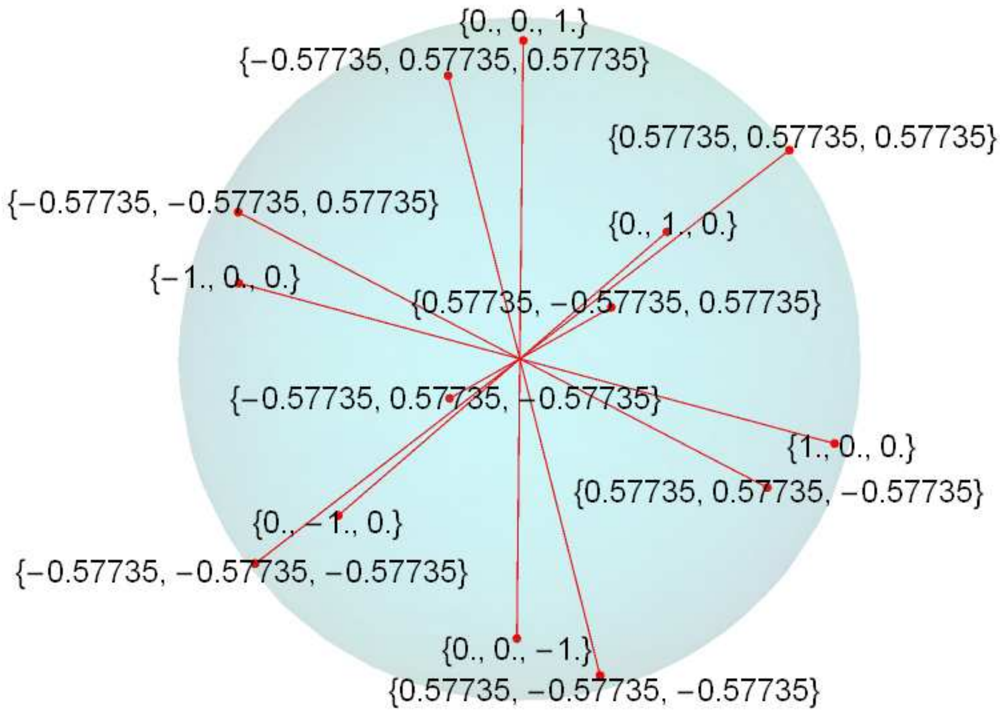
Abstract

In this paper, I describe the positions of the 14 capitals on a spherical planet of 1 radius. The paper ends with "The End"

Introduction

The positions of the 14 capitals on a spherical planet of 1 radius are useful to economics, finance, communication, geopolitics and warfare. In this paper, I describe the positions of the 14 capitals on a spherical planet of 1 radius.

The positions of the 14 capitals on a spherical planet of 1 radius



The End

The geodesics of the 14 capitals on a spherical planet of 1 radius

Soumadeep Ghosh

Kolkata, India

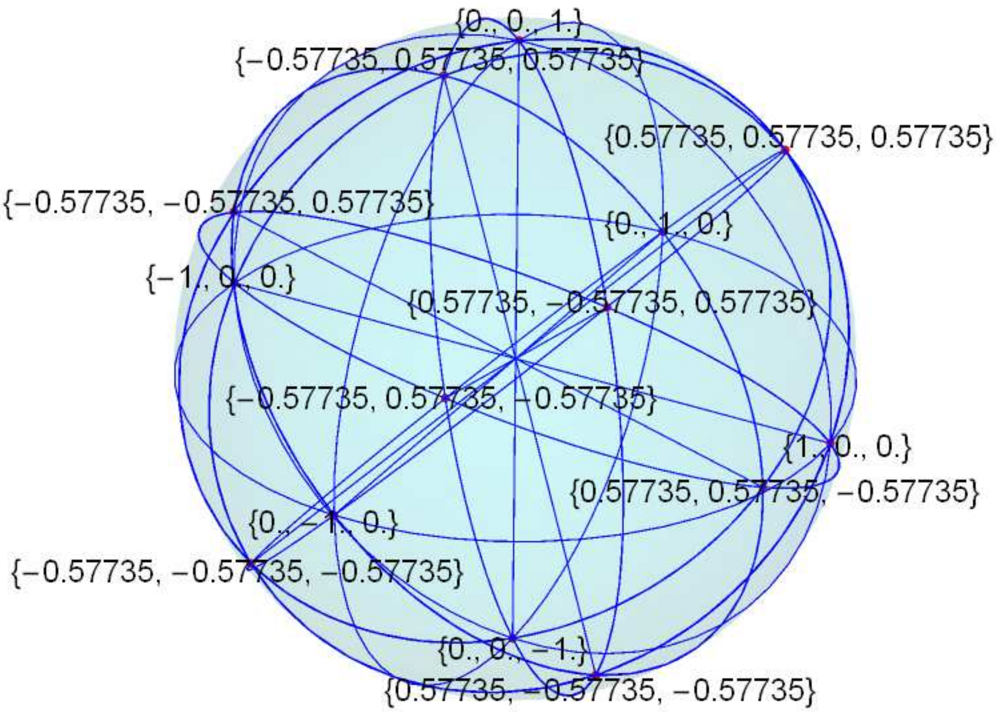
Abstract

In this paper, I describe the geodesics of the 14 capitals on a spherical planet of 1 radius. The paper ends with "The End"

Introduction

In a previous paper, I've described the positions of the 14 capitals on a spherical planet of 1 radius. The geodesics of the 14 capitals on a spherical planet of 1 radius are useful to economics, finance, communication, travel, geopolitics and warfare. In this paper, I describe the geodesics of the 14 capitals on a spherical planet of 1 radius.

The geodesics of the 14 capitals on a spherical planet of 1 radius



The End

The bomb accuracy and payload equation and 14 solutions

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the bomb accuracy and payload equation and provide 14 solutions to the bomb accuracy and payload equation.

Introduction

The bomb accuracy and payload equation is the holy grail of any air force. In this paper, I describe the bomb accuracy and payload equation and provide 14 solutions to the bomb accuracy and payload equation.

The bomb accuracy and payload equation

The bomb accuracy and payload equation is

$$p = a\exp(-a) + b$$

where
$p > 0$ is the payload
$0 < a \leq 1$ is accuracy
$b > 0$ is the bomb-specific constant

14 solutions to the bomb accuracy and payload equation

1. $a = \frac{31}{1402}, p = 57, b = \frac{79914e^{31/1402}-31}{1402e^{31/1402}}$
2. $a = \frac{99}{1402}, p = 10, b = \frac{14020e^{99/1402}-99}{1402e^{99/1402}}$
3. $a = \frac{122}{701}, p = 43, b = \frac{30143e^{122/701}-122}{701e^{122/701}}$
4. $a = \frac{196}{701}, p = 86, b = \frac{2(30143e^{196/701}-98)}{701e^{196/701}}$
5. $a = \frac{403}{1402}, p = 51, b = \frac{71502e^{403/1402}-403}{1402e^{403/1402}}$
6. $a = \frac{237}{701}, p = 57, b = \frac{3(13319e^{237/701}-79)}{701e^{237/701}}$
7. $a = \frac{605}{1402}, p = 49, b = \frac{68698e^{605/1402}-605}{1402e^{605/1402}}$
8. $a = \frac{695}{1402}, p = 98, b = \frac{137396e^{695/1402}-695}{1402e^{695/1402}}$
9. $a = \frac{855}{1402}, p = 53, b = \frac{74306e^{855/1402}-855}{1402e^{855/1402}}$
10. $a = \frac{873}{1402}, p = 96, b = \frac{3(44864e^{873/1402}-291)}{1402e^{873/1402}}$
11. $a = \frac{1027}{1402}, p = 58, b = \frac{81316e^{1027/1402}-1027}{1402e^{1027/1402}}$
12. $a = \frac{1181}{1402}, p = 67, b = \frac{93934e^{1181/1402}-1181}{1402e^{1181/1402}}$
13. $a = \frac{1331}{1402}, p = 1, b = \frac{1402e^{1331/1402}-1331}{1402e^{1331/1402}}$
14. $a = 1, p = 29, b = \frac{29e-1}{e}$

The End

The truth of communication

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the truth of communication.

Introduction

The truth of communication is hidden in plain sight but many fail to recognize the truth of communication. In this paper, I describe the truth of communication.

The truth of communication

Jaara Krishnor bhokto hoye oraai bolte paare.
Jaara Krishnor bhokto hoyena oraa bolte paarena.
Aetaai hocche bawlaar shotti
Aar aetaai oora bawlena.

The End

Geopolitically-useful sites

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I list 3 geopolitically-useful sites on the Internet specific to the fields of defense, intelligence and research. The paper ends with "The End."

Introduction

There exist geopolitically-useful sites on the Internet specific to the fields of defense, intelligence and research. In this paper, I list 3 such sites.

3 geopolitically-useful sites

1. Defense: https://www.janes.com
2. Intelligence: https://www.stratfor.com
3. Research: https://www.rand.org

The End

On credit, leverage and credit crisis

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe credit, leverage and credit crisis. The paper ends with "The End"

Introduction

Many individuals don't realize that **credit** and **leverage** are more common in the modern economy than wealth and money. This is because credit and leverage allow firms to make larger profits that are not possible without credit and leverage. In this paper, I describe credit, leverage and credit crisis.

Credit, leverage and operating profit

Credit (as opposed to debt) is a **positive addition** to the assets side of a **double-entry accounting balance sheet**.

Leverage is defined by

$$L = \frac{C - D}{G}$$

where
C is credit
D is debt
G is gold

Leverage between $10 : 1$ to $20 : 1$ is common in most economies as this immensely facilitates trade.

Note that the numerator $(C - D)$ is not the same as profit. This term is called the **operating profit** P_o.

When the P_o is positive, the firm receives investment in the form of capital from shareholders but also bears risk.

When the P_o is zero, the firm stops receiving investment in the form of capital from shareholders but the firm's risk requires **dissipating**.

When the P_o is negative, the firm becomes eligible for **bankruptcy**.

Credit crisis

Large and persistent operating profits are not consistent with **arbitrage pricing theory**. Therefore, the operating profit of a firm, although positive earlier, eventually becomes zero.

This is beneficial for the economy because the risk in the firm is arbitraged away, but shareholders of the firm refuse to sell their shares because shares pay dividend. Hence, there is balance between risk and reward.

But there is a small probability of the capital in the economy being less than required to arbitrage away the risk in the firm. This situation is called a **credit crisis** and this evolves in one of two ways:

1. The monetary economist produces money that fills the **capital gap**, distributes the money to individuals through banks and the risk is arbitraged away by individuals.

2. The foreign monetary economist with foreign capital does what the monetary economist doesn't, but the risk is arbitraged away all the same, either by a foreign central bank or foreign individuals, since there is reward for the risk.

Similarity to financial crisis

In a previous paper, I've described a method to predict financial crisis. Credit crisis is similar to financial crisis and thus can be predicted by a similar method.

The End

The Monastery probability density function

Soumadeep Ghosh

Kolkata, India

Abstract

In this paper, I describe the Monastery probability density function. The paper ends with "The End"

Introduction

In this paper, I describe the Monastery probability density function which is 1 at $x = 0$ and positive for $-1 \leq x \leq 1$.

The Monastery probability density function

Define

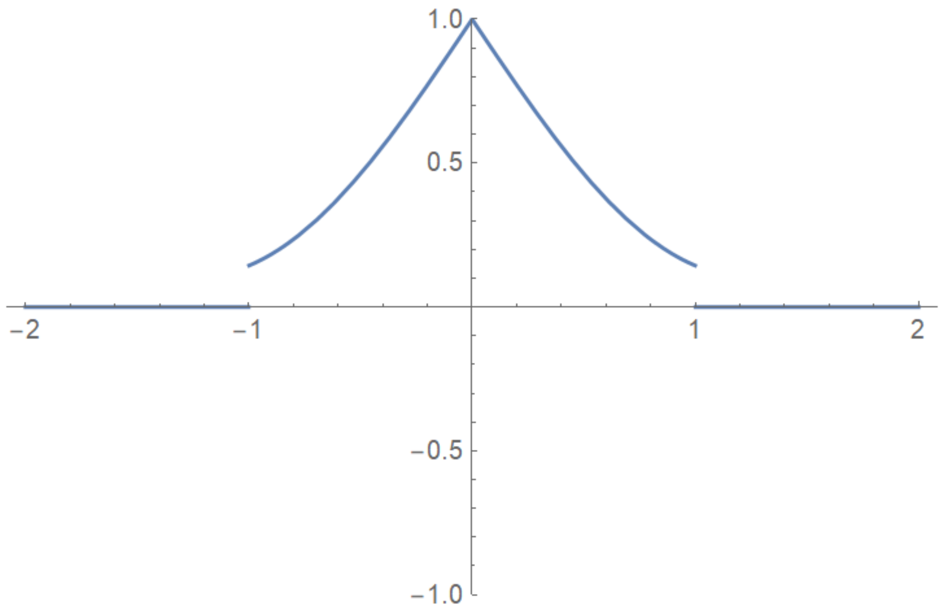
$$f(x) = \begin{array}{cc} 1 - \frac{|sinc(x) J_1(x)|}{2 - 2J_0(1)\cos(1) - 2J_1(1)\sin(1)} & -1 \leq x \leq 1 \\ 0 & x < -1 \vee x > 1 \end{array}$$

where
$J_n(x)$ is the Bessel function of the first kind
Then

1. $0 \leq f(x) \leq 1$
2. $\int_{-\infty}^{\infty} f(x) dx = 1$

Thus $f(x)$ is a probability density function which is 1 at $x = 0$ and positive for $-1 \leq x \leq 1$.

Plot of the Monastery probability density function



The End

Brain-augmentation

Soumadeep Ghosh

Kolkata, India

Abstract

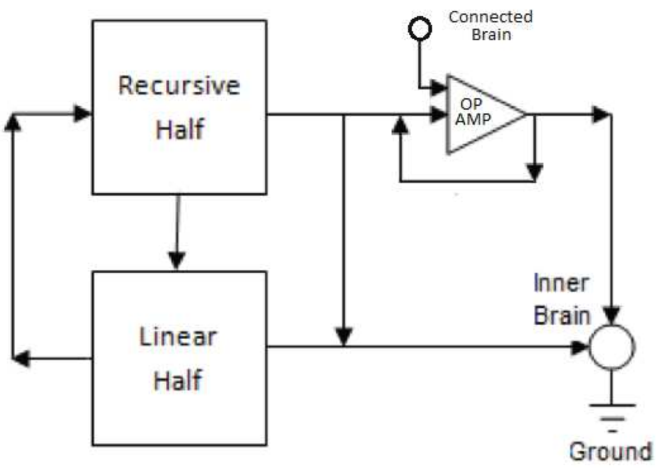
In this paper, I describe the art of brain-augmentation. The paper ends with "The End"

Introduction

Brain-augmentation is a technique from neuroscience that is useful to all individuals. In this paper, I describe the art of brain-augmentation.

Brain-augmentation

Any individual can use brain-augmentation by looking at the following diagram:



The End