

Theory Of Vision And Its Applications In Equation Of Relative Velocity And Equation Of Light Speed

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Abstract

Theory of Vision is a transformation of Vision of Object from one reference point (system) to the other reference point (system). Theory of Vision can be applied to obtain Vision of Object which is used for the calculation of velocity of object. In this paper, Theory of Vision is demonstrated and interpreted by a schematic diagram. In addition, Theory of Vision is applied in the derivations of Equation of Relative Velocity and Equation of Light Speed.

Keywords: *Reference Point, Reference System, Absolute Space System, Vision of Object, Principle of Vision, Theory of Vision, Vision of Light, Light Speed, Special Relativity, Absolute Light Speed, Inertia Light Speed, Equation of Relative Velocity, Equation of Light Speed.*

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I. Reference Point And Reference System

A reference system contains a reference point (reference object) and three fixed perpendicular axes originated at the reference point (reference object). A physical phenomenon is observed at the reference point (system) means that the physical phenomenon is observed while the position of the reference point and directions of three fixed perpendicular axes on an object remain unchanged during the entire observation process. In this book, reference point (reference object) and reference system are always together and mean the same thing.

The position of an object (point) at an instance of time can be observed (measured) at a reference point (system) and represented by a set of three coordinates (Cartesian coordinate) that each is obtained by measuring the projection of the position vector on the corresponding reference axis with a scale of unit length.

Also, the instance of time can be measured by the following two methods: (1) Real time onsite measurement, in which time is measured onsite with the object in real time by an optical sensor, such that any time delay caused by the optical signal communication process can be avoided, and (2) Delay time offsite measurement, in which time is measured by an offsite optical sensor at the reference point (system) where the time delay caused by optical signal communication process must be considered.

II. Absolute Space System

In the universe, everything (object) is moving relatively to the Space. There is no such thing (object) as a fixed reference point (system) in the Space. However, when a photon emitted from a light source, it generates a straight optical path from its light origin (not light source) into space. This light origin is a point without substance and has a fixed position in the Space that doesn't move with the light source, nor the earth or anything else. Therefore, an Absolute Space System can be defined by the light origin and three fixed perpendicular axes with each axis pointing to a fixed far distance star (such as North Star) from the light origin.

III. Vision Of Object

Vision of Object is the image of an object observed (measured) at a reference point (system) during a period of time. More specifically, Vision of Object is a group of consecutive positions and directions of an object observed at a reference point (system) during a period of time.

IV. Principle Of Position And Principle Of Vision

The actual position and direction of an object observed at an Absolute Space System at an instant of time is fixed. It doesn't change with any object or event. However, the position and direction of the object observed at a reference point (system) at an instance of time can be different subject to the reference point (system), which is represented by a set of three coordinates (Cartesian coordinates) that each is obtained by measuring the projection of the object on the corresponding reference axis by a designated unit length. Even through, the position and direction of the object observed at the same reference point (system) at an instance of time remain unchanged no matter of other objects or events. This is named "Principle of Position".

As a consequence, the actual positions and directions of an object observed at an Absolute Space System in a period of time are also fixed. It doesn't change with any object or event. However, the positions and directions of the object observed at a reference point (system) in a period of time named "Vision of Object" can be different subject to the reference point (system). Even through, the "Vision of Object" observed at the same reference point (system) in a period of time remain unchanged no matter of other objects or events. This is named "Principle of Vision" (revised from [1]).

V. Theory Of Vision – Transformation Of Vision Of Object

Based on Principle of Vision, a vision of object, in addition to being observed (measured) directly at a reference point (system) during a period of time, can be obtained by the transformation from the vision of the object observed at another reference point (system) having the same reference axes to that of the reference point (system) (revised from [1]).

The position of the object at each time frame observed (measured) at the other reference point (system) can be transformed to the corresponding position of the object at the reference point (system) by overlapping the reference point and axes observed (measured) at the other reference point (system) accordingly on top of each other in time sequence.

Because of Principle of Position, the same relative positions and directions between the object and the reference point (system) observed at the other reference point (system) should be maintained, such that the vision of object observed at the reference point (system) can be constructed. This transformation is named "Theory of Vision" or Transformation of Vision of Object [1].

In addition, Theory of Vision can be interpreted by transformation of vision of object in Absolute Space System. A schematic diagram in Fig. 1 shows the transformation of vision of object of R_1 (from R to R') observed at reference point P' ($=P$) to vision of object of R_2 (from R_2 to R') observed at reference point Q' ($=Q$). PQR and $P'Q'R'$ are the initial and final positions of three points (objects) in Absolute Space System. When observed at point P , means point P is fixed, then $P = P'$ and $PQR = P'Q_1R_1$, such that from R_1 to R' is the vision of object of point R observed at point P . On the other hand, when observed at point Q , means point Q is fixed, then $Q = P'$ and $PQR = P_2Q'R_2$, such that R_2 to R' is the vision of object of point R observed at point Q .

Furthermore, when observed at point P , by overlapping Q_1 on top of Q' , then a traveling path of R can be obtained from R_2 to R' , which is equal to the vision of object of point R observed at point Q . This proves a proof to Theory of Vision, the transformation of vision of object from one reference point (system) to another reference point (system).

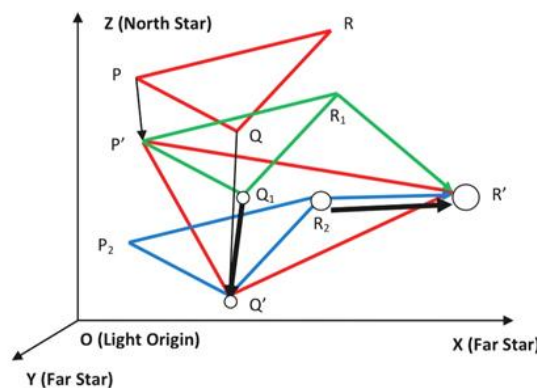


Fig. 1 Theory of Vision is interpreted by the transformation of vision of object in Absolute Space System. A schematic diagram shows the transformation of vision of object R_1 ($R_1 \rightarrow R'$) observed at reference point P' ($=P$) to vision of object R_2 ($R_2 \rightarrow R'$) observed at reference point Q' ($=Q$).

For a better understanding, two schematic diagrams are illustrated here to show the transformation process of Vision of Object from one reference point (system) to another reference point (system).

Fig. 2 (revised from [1]) shows the vision of object and vision of observer (designated reference point) observed (measured) at reference point O in different time frames. Object t_1 , Object t_2 and Object t_3 represent the positions and directions of the objects; and Observer t_1 , Observer t_2 and Observer t_3 represent the positions and directions of the observer (designated reference point), which are observed (measured) at a reference point O in the time frame t_1 , t_2 and t_3 respectively. The curve from Object t_1 to Object t_2 and Object t_3 represents the vision of the object observed (measured) at reference point O during the time period from t_1 to t_3 .

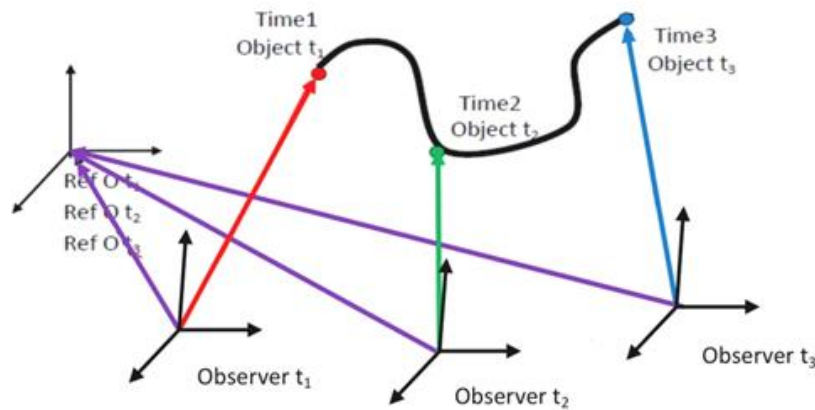


Fig 2 Vision of an object observed at a reference point.

Fig. 3 (revised from [1]) shows the vision of object observed (measured) at the observer (designated reference point) transformed from that observed (measured) at reference point O in Fig. 2. In which, Observer t_1 , Observer t_2 and Observer t_3 and their reference systems observed (measured) at the reference point O in Fig. 2 are completely matched and overlapped on top of Observer t_3 . Meanwhile, the relative positions and directions of the Object t_1 , Object t_2 and Object t_3 respectively to Observer t_1 , Observer t_2 and Observer t_3 are maintained the same as that observed at reference point O in Fig. 2. As a result, the vision of object as the curve from Object t_1 to Object t_2 and Object t_3 observed (measured) at the observer (the designated reference point) during the time period from t_1 to t_3 is transformed from the vision of object observed (measured) at the reference point O.

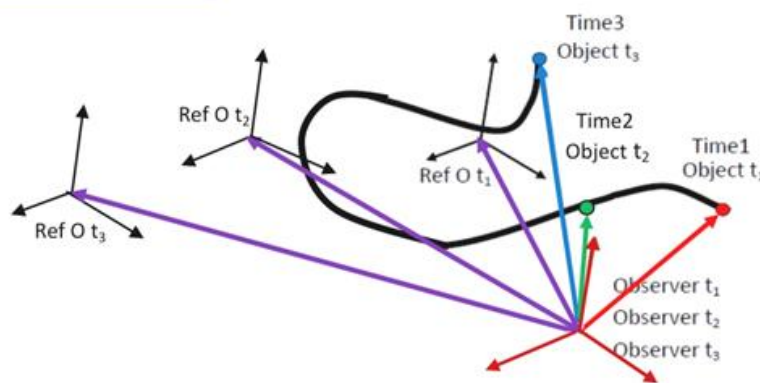


Fig 3 Vision of an object observed at an observation point constructed from a reference point.

VI. Vision Of Light

Vision of Light [1] is the image of a photon observed (measured) at a reference point (system) during a period of time. More specifically, vision of light is a group of consecutive positions and directions of a photon observed at a reference point (system) during a period of time. Similar to vision of object, in addition to being observed (measured) directly at the reference point (system), Vision of Light can be produced by transformation from that observed at the other reference point (system) such as the light origin in Absolute Space System.

VII. Definition Of Object Speed

Speed of object is the property of an object that can only be generated by observation at a reference point (system). It is defined by the traveling distance of the object observed and measured at the reference point (system) divided by the traveling time of the object measured onsite with the object or offsite at the reference point. Since the traveling distance of an object is measured based on the Vision of Object observed at the reference point (system) during a period of time, therefore the speed of object is calculated by Vision of Object divided by the traveling time of the object observed at the reference point (system).

According to Theory of Vision, in order to obtain Vision of Object observed at a designated reference point (system), the position of the object at each instance of time observed at a reference point (system) must be transformed to the corresponding position observed at the designated reference point (system) by superimposing the designated reference point (system) at each instance of time on to that of the last instance of time, while maintaining the relative position and direction between the object and the designated reference point (system), such that Vision of Object observed at the designated reference point (system) can be produced.

As to the traveling time of the object, it is measured offsite at the reference point (system) where time delay caused by optical signal traveling process is negligible simply because that light speed is much faster than object speed.

VIII. Definition Of Light Speed

Like speed of object, Speed of Light is also defined by the Vision of Light observed at the reference point (system) divided by the traveling time of the photon measured on site with the photon. In case that photon traveling time is measured at the reference point (system), optical signal (photon or EM waves) traveling times from starting point and ending point to the reference point need to be considered in order to get the actual photon traveling time.

IX. Equation Of Relative Velocity

As illustrated in Fig. 4 [2], the relative vision of objects oL_P , oL_S and sL_P observed at any three points O, P and S in the same time interval obey the following equation:

$$oL_P = oL_S + sL_P$$

Where oL_P is the vision of point P observed at point O, oL_S is the vision of point S observed at point O, and sL_P is the vision of point P observed at point S in the same time interval.

Also, relative velocities oV_P , oV_S and sV_P observed at any three points O, P and S at the same time obey the following equation:

$$oV_P = oV_S + sV_P$$

Where oV_P is the velocity of point P observed at point O, oV_S is the velocity of point S observed at point O, and sV_P is the velocity of point P observed at point S at the same time. For consistency, the same unit quantities at point O can be applied in the equation. This equation is called "Equation of Relative Velocity" [2].

Equation of Relative Velocity is true at any instant time. In case two of the three velocities are constant then the third one is also constant and Equation of Relative Velocity should be true at all times. For example, oV_S and oV_P are constant velocities then sV_P is also a constant velocity.

sV_P is the velocity of point P observed at point S. It is the vision of point P observed at point S (sL_P or $P''P'$ in Fig. 4) divided by the time interval Δt . According to Theory of Vision, vision of point P observed at point S ($P''P'$) can be obtained by overlapping all the positions of point S observed at point O during Δt , while maintaining the relative positions and directions between point P and point S (Fig. 4). Although both $P''P'$ and Δt can be measured by the unit quantities at different reference points dependent on the local gravitational field and aging of the universe. However, for consistency, the same unit quantities at point O can be applied in measurement of sV_P .

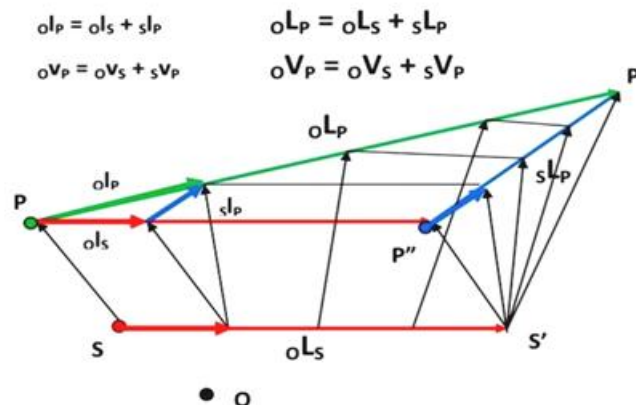


Fig. 4 Equation of Relative Velocities $oV_P = oV_S + sV_P$ at any instant time or for constant velocities at any time. Where O is reference object, S and P are two moving objects, oV_P is the velocity of P observed at O, oV_S is the velocity of S observed at O and sV_P is the velocity of P observed at S.

X. Light Speeds Observed At Different Reference Points

Fig. 5 shows a schematic diagram of the Visions of Light of an emitted photon observed at the light origin (point A), ground (point B) and light source (point C) in Absolute Space System at light origin (designated reference point). Because of the motions of earth and the light source with respect to the light origin, ground and light source are drifted away from the light origin respectively. Based on Principle of Vision (relative positions and directions between two objects maintain unchanged no matter of reference point) and Theory of Vision (transformation of vision of object to different reference points). Different Visions of Light can be represented by the following straight lines: **AP**—the Vision of Light observed at light origin (black line), **BP**—the Vision of Light observed at ground (red line) and **CP**—the Vision of Light observed at the light source (green line) respectively. They are all ended at the same final position (point P) of the emitted photon.

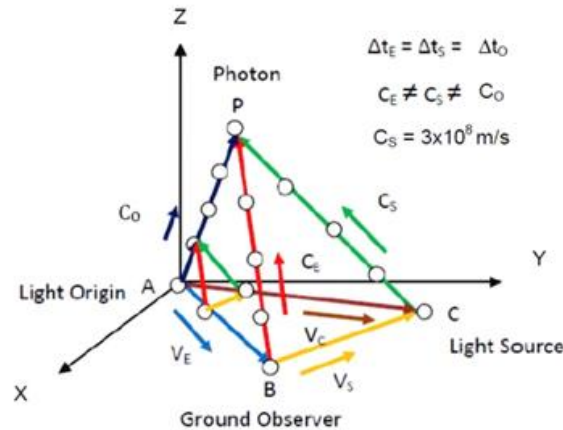


Fig. 5 Visions of Light of an emitted photon observed at the light origin (black line), ground (red line) and light source (green line) in Absolute Space System.

In case all motions are at constant speeds, after a time interval Δt (assuming at the same gravitational field), the light speeds C_0 , C_E and C_S observed respectively at point A (light origin), B (ground) and C (light source) can be correlated as follows:

AP (Vision of Light observed at light origin) is the vector summation of **CP** (Vision of Light observed at the light source) and **AC** (moving path of the light source observed at the light origin). Therefore, C_0 (light speed observed at light origin) is the vector summation of C_S (light speed observed at the light source) and V_C (moving speed of the light source observed at the light origin).

$$\mathbf{AP} = \mathbf{CP} + \mathbf{AC}$$

$$C_0 = C_S + V_C$$

AP (Vision of Light observed at light origin) is the vector summation of **BP** (Vision of Light observed at ground) and **AB** (moving path of earth observed at the light origin). Therefore, C_0 (light speed observed at light origin) is the vector summation of C_E (light speed observed at ground) and V_E (moving speed of ground observed at the light origin).

$$\mathbf{AP} = \mathbf{BP} + \mathbf{AB}$$

$$C_0 = C_E + V_E$$

BP (Vision of Light observed at ground) is the vector summation of **CP** (Vision of Light observed at the light source) and **BC** (moving path of the light source observed at ground). Therefore, C_E (light speed observed at ground) is the vector summation of C_S (light speed observed at the light source) and V_S (moving speed of the light source observed at ground).

$$\mathbf{BP} = \mathbf{CP} + \mathbf{BC}$$

$$C_E = C_S + V_S$$

Because of the constant repulsive string forces generated between photon and the adjacent Wu's Pairs on the surface of the light source in the photon two stage emission process, a constant light speed C_S (Absolute Light Speed 3×10^8 m/s dependent on the gravitational field at the light source) in the photon ejection direction can always be observed at the light source regardless of the frequency of the photon and the moving speeds of the light source away from the reference points such as that observed either at the light origin or at the ground (V_C or V_S).

Since photon traveling time in an event is always the same no matter of the observation point (reference point), therefore $\Delta t_E = \Delta t_S = \Delta t_O$. However, the Visions of Light observed at different reference points can be different such as $AP \neq BP \neq CP$. Because light speed is defined as Vision of Light divided by photon traveling time observed at the observation point (reference point), therefore the light speeds are different at different observation positions (reference points) such as $C_E \neq C_S \neq C_O$. These oppose to Einstein's Special Relativity in which he claimed that light speed is always constant no matter the light source and observation (reference point).

As a result, all the light speeds observed in Fig. 23 including $C_O = C_S + V_C$, $C_O = C_E + V_E$ and $C_E = C_S + V_S$ agree with Equation of Relative Velocity.

XI. Photon Inertia Transformation

Photon just like electron or any other particle, while emitted from the light source (parent object), it travels at a constant speed observed at light origin which is a vector summation of two speeds: (1) Ejection Speed which is the speed observed at the light source at time of emission (Absolute Light Speed 3×10^8 m/s, where m/s is dependent on the local gravitational field and aging of the universe) caused by the constant ejection force (string force) between two Wu's Pairs no matter of frequency and light source, and (2) Inertia Speed which is the speed of light source observed at light origin at time of emission. This process is called "Photon Inertia Transformation"[1].

In contrast, Phonon (quantum of sound) is not a particle emitted from the vibrator (sound source). Instead, it is a surge of energy wave that is generated in the sound medium by the vibrator, carrying and transmitting energy radically in the sound medium at a nature speed of the sound medium no matter of the vibrator (sound source). This process is called "Non-inertia Transformation".

XII. Absolute Light Speed And Inertia Light Speed

At photon Ejection Stage, under thermal equilibrium, because of the same repulsive string forces between photon and the adjacent Wu's Pairs on the surface of the light source, regardless of the frequency, a photon should always have a constant light speed 3×10^8 m/s in vacuum, where m/s is dependent on the local gravitational field and aging of the universe (revised from [1][3]). This initial light speed observed at the light source at time of emission is called "Absolute Light Speed".

However, under the same thermal equilibrium but different subatomic equilibriums, Absolute Light Speed is dependent on Wu Unit Length which is a function of local gravitational field and aging of the universe (light source). Therefore, Absolute Light Speed is also dependent on local gravitational field and aging of the universe (light source). According to Wu's Spacetime Shrinkage Theory, at massive gravitational field and early aging of the universe, Absolute Light Speed is slower while Wu Unit Length is bigger.

Absolute Light Speed doesn't change with temperature. When temperature increases, the microstructure and macrostructure of the object expand (thermal expansion) and more electrons move to the higher dynamic energy states. But Wu Unit Length and Wu Unit Time in the subatomic structures remain unchanged, as is the Absolute Light Speed. However, Wu Unit Length can be influenced by particle bombardments such as static graviton flux and dynamic graviton flux, which results in the dependence of Absolute Light Speed on gravitational field and aging of the universe. Furthermore, plasma bombardment and angular momentum may also influence Absolute Light Speed.

At the Separation Stage of photon emission process, according to classical Newtonian physics, photon also carries the inertia of the parent object (light source). Therefore, at the time of emission, photon travels not only with the Absolute Light Speed (3×10^8 m/s dependent on the gravitational field and aging of the universe at the light source) in the trajectory direction observed at the light source, but also at a speed and direction as that of the light source observed at light origin (or at the reference point). This initial speed of light source observed at light origin at the time of emission is called "Inertia Light Speed".

XIII. Equation Of Light Speed

According to Equation of Relative Velocity [2], light speed observed at a reference point O_{CP} is the vector summation of the speed of light source observed at the reference point O_{VS} and Light Speed observed at light source S_{CP} .

$$O_{CP} = O_{VS} + S_{CP}$$

This equation is true at any instant time. In case two of the three velocities are constant then the third one is also constant and the above equation should also be true at all times.

Therefore, Equation of Light Speed [1][3] can be represented by a vector summation as follows:

$$C' = C + V$$

Where C' is the light speed observed at reference point, C is the light speed observed at light source and V is the speed of light source observed at reference point. For consistency, the same unit quantities at reference point can be applied in the equation.

Equation of Light Speed is true at any instant time. In case any two of the three speeds C' , C and V are constant, then the third one is also constant and Equation of Light Speed is true at all times.

At the time of light emission, light speed observed at light source is frequency independent constant called Absolute Light Speed ($C = 3 \times 10^8$ m/s, where m/s is dependent on the local gravitational field and aging of the universe), which is the initial light speed observed at light source. On the other hand, the speed of light source observed at light origin is Inertia Light Speed which is the initial speed of light source observed at light origin. Therefore, at the time of emission, the light speed observed at light origin is the vector summation of Absolute Light Speed and Inertia Light Speed. In fact, the light speed observed at light origin is always constant as the vector summation of Absolute Light Speed and Inertia Light Speed. This is named "Light Origin Constant Light Speed Theory" [4]. In addition, at the time of light emission, light speed observed at a reference point is the vector summation of Absolute Light Speed and the speed of light source observed at the reference point (different from Inertia Light Speed observed at light origin).

In case the speed of light source observed at light origin is constant (equal to Inertia Light Speed), since the light speed observed at light origin is always constant, then according to Equation of Relative Velocity, the light speed observed at light source is also constant (equal to Absolute Light Speed). Furthermore, In case both the light speed and the speed of light source are constant observed at the reference point, then the light speed observed at light source is also constant (equal to Absolute Light Speed) (revised from [2]). Also, In case both reference point speed observed at light origin and the speed of light source observed at the reference point are constant, then the light speed observed at light source is also constant (equal to Absolute Light Speed).

Equation of Light Speed is the "Law of Light" which indicates directly that "Light Speed Is Not Constant". In other words, it shows that Einstein's postulation "Light Speed is always constant no matter of light source and observation" is not true and Special Relativity is false. In addition, Equation of Light Speed can be applied to explain many physical phenomena such as Cosmological Redshift, Hubble's Law, Spacetime Reverse Expansion (Universe Expansion), Gravitational Redshift and Deflection of Light which are affected by Absolute Light Speed and Wavelength dependent on the local gravitational field and aging of the universe. It can also be applied to interpret Axial Redshift, Transverse Redshift, Acceleration Redshift and Event Horizon, which are influenced by Inertia Light Speed and direction due to the relative motions between light source and reference point. As a consequence, these phenomena can also be considered as the nature proofs to Equation of Light Speed, as well as that "Light Speed Is Not Constant" [5].

XIV. Conclusion

Theory of Vision is a transformation process of Vision of Object from one reference point (system) to the other reference point (system). Theory of Vision can be applied to obtain Vision of Object which is used for the calculation of velocity of object. In this paper, Theory of Vision is exhibited and interpreted by a schematic diagram. In addition, Theory of Vision is applied in the derivations of Equation of Relative Velocity and Equation of Light Speed.

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