



New connection on: : 24-08-2018 : 18:09:27 - Last disconnection on: : 23-08-2018 : 04:55:49

V 4.0.0.44358(LP,U,linux) (Rev:43856 2017-04-27 09:03:29 +0200#(D201802)) (RPM D201802)

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 Database: EPODOC

[EPODOC: SS 1] SIMULATOR AND IMMERSIVE AND TRAINING AND UAV AND OPERATORS

Results in EPODOC 0

[SS 2] simulator AND uav

Results in EPODOC 13

[SS 3] ..li



1/13 © EPODOC / EPO

PN - [US2018233061](#) A1 20180816
PR - IL20150240461
20150810; WO2016IL50807
20160724
AP - US201615746259 20160724
DT - **
CCI - [G09B9/085](#) ; [G09B9/30](#) ;
[G09B9/48](#)
CUI - [G06G7/72](#) ; [G09B9/302](#)
PA - ISRAEL AEROSPACE IND LTD [IL]
TI - UNMANNED VEHICLE **SIMULATOR**
AB - The presently disclosed subject matter includes a Ux V system **simulator**. According to some examples synthetic images are display on the display device, the synthetic images showing an artificial

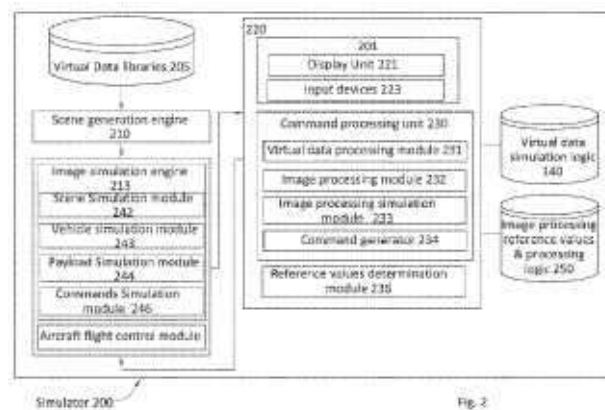


Fig. 2

representation of an environment in which operation of a Ux V is being simulated, the images are shown as if viewed from a vantage point of an imaging payload located onboard the Ux V; the images are processed to extract therefrom values of one or more graphic image parameters; responsive to a command issued with respect to the synthetic images, the extracted values are compared with respective predefined reference values; A simulation of the issued command is executed only if the comparison between the extracted values and respective reference values complies with at least one predefined condition, thereby increasing similarity between the operation of the **simulator** and the operation of the real **UAV** system being simulated.

2/13 © EPODOC / EPO

PN - [CN107870576](#) A 20180403

PR - CN201711344735 20171215

AP - CN201711344735 20171215

DT - I

CNOI - [G05B17/02](#)

PA - SICHUAN HANKE COMPUTER INFORMATION TECH CO LTD

TI - Engineering **simulator** applied to flight simulation

AB - The invention relates to an engineering **simulator** applied to flight simulation. The engineering **simulator** comprises a master station, a display, a fault emitter, a flight data calculator and a signalemitting/receiving antenna; the master station and a fault-controlling emitter used for connecting the fault emitter are used for emitting a fault simulation signal to a **UAV** (unmanned aerial vehicle), the **UAV** is used for performing fault simulation flight after receiving the fault simulation signal and reverses back fault simulation flight data, the signal emitting/receiving antenna is used for receiving the fault simulation flight data and transmitting the data to the flight data calculator, the flight data calculator is connected with the display, meanwhile, signal processing is performed on received data, and real-time display is performed by the display. The engineering **simulator** can be truly used for simulating the physical fault flight of the **UAV**.

3/13 © EPODOC / EPO

PN - [RU2015150517](#) A 20170602

PNFP - RU2629709 C2 20170831

PR - RU20150150517 20151125

AP - RU20150150517 20151125

DT - I

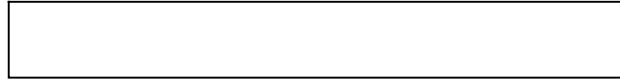
CT - || STSE (C2)
[RU2163387](#) C1 20010220 [] (GUP TSENTRAL NY, et al);
[RU105466U](#) U1 20110610 [];
[US6969992](#) B2 20051129 [] (UNIV MINNESOTA [US]);
[US3474447](#) A 19691021 [] (RAYTHEON CO);
[US5541607](#) A 19960730 [] (HUGHES AIRCRAFT CO [US]);
[US3982244](#) A 19760921 [] (US ARMY);
[US5489869](#) A 19960206 [] (ROCKWELL INTERNATIONAL CORP [US]);
[US4002980](#) A 19770111 [] (SIEMENS AG);
[SU1758617](#) A1 19920830 [] (RYBINSKIY AVIATION [SU]);
[RU2469348](#) C2 20121210 [] (FEDERAL NOE G AVTONOMNOE OBRAZOVATEL NOE UCHREZHDENIE VYSSHEGO PROFESSIONAL NOGO OBRAZOVANIJA JUZHNY [RU])

CNOA - (C2)
[F41G3/00](#)

PA - (C2)
AKTSIONERNOE OBSHCHESTVO KONTSEKSN GRANIT-ELEKTRON [RU]

TI - (C2)
DEVICE FOR SEMI-NATURAL MODELING CONTROL SYSTEM OF UNMANNED AIRCRAFT VEHICLE WITH RADAR SIGHT

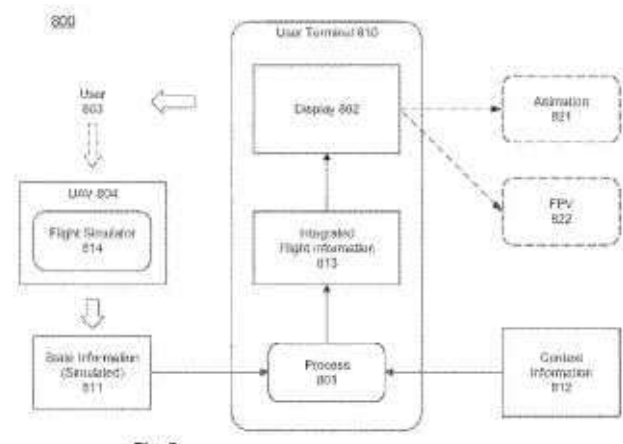
AB - (C2)
FIELD: radio engineering, communication. SUBSTANCE: device contains a radar sight with a computer, a three-stage dynamic rocking stand, an



echo **simulator**, a power divider, phase modulators, delay blocks, doppler frequency shift simulators, controlled attenuators, horn antennas, movable bases, an electromechanical target movement **simulator**, an anechoic chamber made in the form of a space covered with a radio-absorbing material, a controlled interference signal attenuator, an interference signal **simulator**, a control panel, an **UAV** and external flight conditions imulating device, an **UAV** motion **simulator**, a wind gust **simulator**, an elasticity **simulator**, a **simulator** of radio altimeter and the underlying surface, a block generating the control signals, a **simulator** of rudders. The stand is equipped with digital angle sensors and the platform turn speed, limit switches. The target movement **simulator** is made in the form of a truss, on which the mounting device is fixed with a guide on it installed for moving movable bases executed in the form of carriages and equipped with a rack.EFFECT: increasing the reliability of modeling.1 dwg

4/13 © EPODOC / EPO

PN - [CN106796761](#) A 20170531
 PR - WO2014CN88051
 20140930; WO2014CN89605
 20141027; WO2015CN82415
 20150626
 AP - CN2015853266 20150626
 DT - I
 CCI - [G09B9/08](#)
 CUI - [G09B9/24](#) ; [G09B9/302](#) ;
[G09B9/46](#)
 PA - SZ DJI TECHNOLOGY CO LTD



- TI - System and method for supporting simulated movement
- AB - System and method can support a simulated movement of a movable object, such as a simulated flight of an unmanned aircraft vehicle (**UAV**). A process, which can be on a user terminal, can receive state information about the simulated flight from a flight **simulator** that is associated with the **UAV**. Then, the process can determine flight information for the simulated flight by associating the received state information with context information obtained by the process on the user terminal, and provides the determined flight information to a display that is associated with the user terminal.

Fig. 8

5/13 © EPODOC / EPO

- PN - [US2017061813](#) A1 20170302
- PR - WO2014CN88051
20140930; WO2014CN89605
20141027; WO2015CN82415
20150626
- AP - US201615349893 20161111
- DT - **
- CT - || R141 (A1)
[US6527225](#) B1 20030304 [] (SILDER JR STEPHEN H [US], et al);
[US2008147366](#) A1 20080619 [] (SCHUTZ JASON [US], et al);
[US2009069957](#) A1 20090312 [] (NAKAMURA KATSU [JP]);
[US8239047](#) B1 20120807 [] (BERGERON BRYAN [US]);
[US5947824](#) A 19990907 [] (MINAMI KOJIRO [JP], et al);
[US2006223637](#) A1 20061005 [] (ROSENBERG LOUIS B [US]);
[US2015064658](#) A1 20150305 [] (HALES SIMON ANTHONY [US],

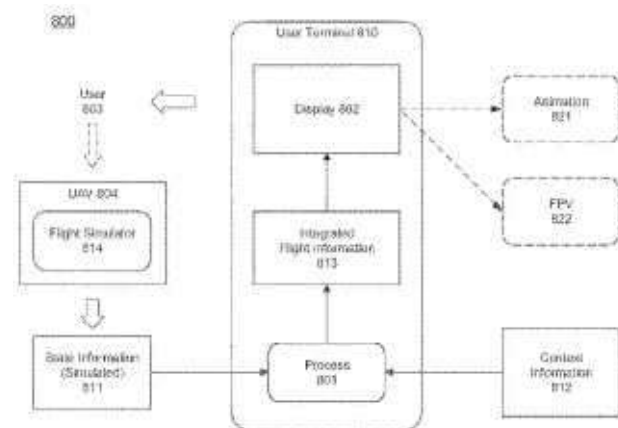


Fig. 8

et al);
[US2015302756](#) A1 20151022 [
] (GUEHRING OLAF [DE], et al)

CCI - [G09B9/08](#)

CUI - [G09B9/24](#) ; [G09B9/302](#) ;
[G09B9/46](#)

PA - SZ DJI TECHNOLOGY CO LTD [CN]

TI - SYSTEM AND METHOD FOR
 SUPPORTING SIMULATED
 MOVEMENT

AB - System and method can support
 a simulated movement of a
 movable object, such as a
 simulated flight of an unmanned
 aircraft vehicle (**UAV**). A process,
 which can be on a user terminal,
 can receive state information
 about the simulated flight from a
 flight **simulator** that is
 associated with the **UAV**. Then,
 the process can determine flight
 information for the simulated
 flight by associating the received
 state information with context
 information obtained by the
 process on the user terminal,
 and provides the determined
 flight information to a display
 that is associated with the user
 terminal.

6/13 © EPODOC / EPO

PN - [WO2017025948](#) A1 20170216

PR - IL20150240461 20150810

AP - WO2016IL50807 20160724

DT - *; Rep

CT - |IL| ISR (A1)
[US2011301925](#) A1 20111208
 [X] (MCWILLIAMS III GEORGE T
 [US], et al)
 [X] 1-19
 * entire document *;
[US8229163](#) B2 20120724
 [A] (COLEMAN NORMAN P [US], et
 al)
 [A] 1-19
 * columns 41-42, figures 57-58 *

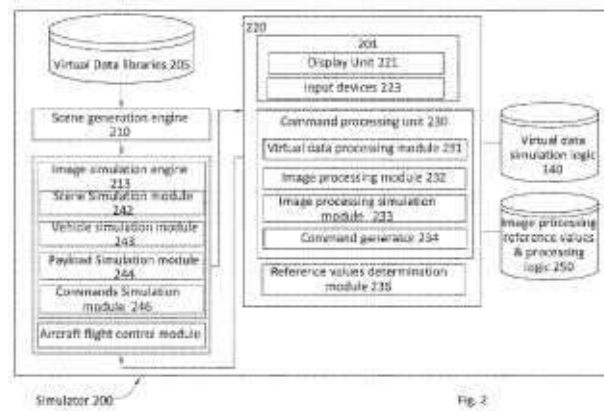


Fig. 2

CCI - [G09B9/085](#) ; [G09B9/30](#) ;
[G09B9/48](#)

CUI - [G06G7/72](#) ; [G09B9/302](#)

PA - ISRAEL AEROSPACE IND LTD [IL]

TI - UNMANNED VEHICLESIMULATOR

AB - The presently disclosed subject matter includes a Ux V system **simulator**. According to some examples synthetic images are display on the display device, the synthetic images showing an artificial representation of an environment in which operation of a Ux V is being simulated, the images are shown as if viewed from a vantage point of an imaging payload located onboard the Ux V; the images are processed to extract thereform values of one or more graphic image parameters; responsive to a command issued with respect to the synthetic images, the extracted values are compared with respective predefined reference values; A simulation of the issued command is executed only if the comparison between the extracted values and respective reference values complies with at least one predefined condition, thereby increasing similarity between the operation of the **simulator** and the operation of the real **UAV** system being simulated.

7/13 © EPODOC / EPO

PN - [KR20160071631](#) A 20160622

PNFP - KR101685116B B1 20161209

PR - KR20140179009 20141212

AP - KR20140179009 20141212

DT - I

CT - || STSE (A)
[KR20130088506](#) A 20130808 [] (KOREA ELECTRONICS TELECOMM [KR]);
[KR101083128B](#) B1 20111111 [] (KOREA AEROSPACE IND LTD [KR]);

[KR100766000B](#) B1 20071012 [] (KOREA AEROSPACE RES INST [KR]);
[KR20120088303](#) A 20120808 [] (AGENCY DEFENSE DEV [KR])

CNOI - (A)
[B64C13/20](#) ; [B64F5/00](#) ; [B64F5/10](#)
 PA - (A)
 HANWHA CORP [KR]
 TI - (A B1)
 SYSTEM AND METHOD FOR VERIFYING CONTROL INFORMATION
 AB - (A)

The present invention relates to a system and a method for verifying control information. The system and the method for verifying control information is to verify control information generated from a ground operation control system (GOCS) of an unmanned aerial vehicle (UAV) without interworking with the UAV which is hardware. The system for verifying control information includes: a UAV ground operation control unit generating the control information and calculating a state estimation value on a virtual UAV based on the control information; and a UAV simulator simulating a movement of the virtual UAV using the control information and generating UAV simulation information based on simulated movement information of the virtual UAV. The UAV ground operation control unit verifies the control information by comparing the state estimation value and the UAV simulation information.

8/13 © EPODOC / EPO

PN - [WO2016050099](#) A1 20160407
 PR - WO2014CN88051
 20140930; WO2014CN89605
 20141027
 AP - WO2015CN82415 20150626
 DT - *; Rep
 CT - [CN] ISR (A1)
[CN104029825](#) A 20140910
 [X] (CHINESE PLA ARMORED
 FORCE ENGINEERING INST)
 [X] 1-60
 * description paragraphs [0048]
 -[0055], figures 1-4 *;
[US2014113255](#) A1 20140424
 [X] (LECHNER ROBERT JAMES [US],
 et al)
 [X] 1-60
 * description paragraphs [0043]
 -[0123], figures 1-5 *;
[CN203551961U](#) U 20140416
 [X] (APPLIC TECHNOLOGY INST OF
 CHINA NORTH IND GROUP CORP
 COMP)
 [X] 1, 2, 15, 16, 29- 32, 45, 46, 59,
 60

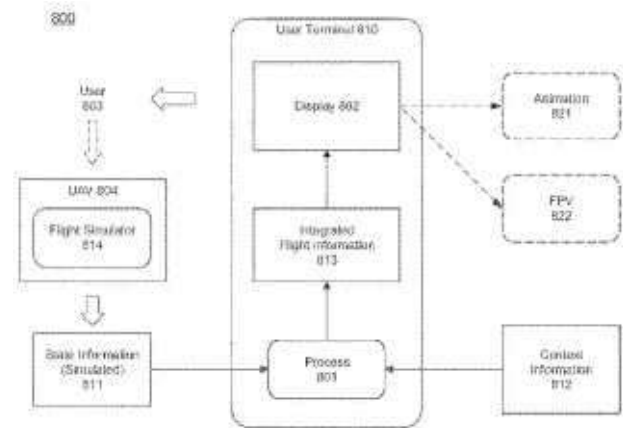


Fig. 8

* description paragraph [0007],
figure 1 *;
[US2014221061](#) A1 20140807
[A] (SITNIKAU ANTON [BY])
[A] 1-60
* the whole document *

- CCI - [G09B9/08](#)
- CUI - [G09B9/24](#) ; [G09B9/302](#) ;
[G09B9/46](#)
- PA - SZ DJI TECHNOLOGY CO LTD [CN]
- TI - SYSTEM AND METHOD FOR
SUPPORTING SIMULATED
MOVEMENT
- AB - System and method can support
a simulated movement of a
movable object, such as a
simulated flight of an unmanned
aircraft vehicle (**UAV**). A process,
which can be on a user terminal,
can receive state information
about the simulated flight from a
flight **simulator** that is
associated with the **UAV**. Then,
the process can determine flight
information for the simulated
flight by associating the received
state information with context
information obtained by the
process on the user terminal,
and provides the determined
flight information to a display
that is associated with the user
terminal.

9/13 © EPODOC / EPO

- PN - [KR101418491B](#) B1 20140714
- PR - KR20130050026 20130503
- AP - KR20130050026 20130503
- DT - I
- CT - || STSE (B1)
[KR101083049B](#) B1 20111116 [] (LIG NEX1 CO LTD [KR]);
[KR101236195B](#) B1 20130226 [] (REPUBLIC OF KOREA THE ARMY CHIEF OF STAFF [KR]);
[KR20070057604](#) A 20070607 [] (KOREA ELECTRONICS TELECOMM [KR]);
[KR20110050298](#) A 20110513 [] (UNIV KONKUK IND COOP CORP [KR])
- CNOI - [G09B9/12](#) ; [G09B9/16](#) ; [G09B19/165](#)
- PA - KOREA AEROSPACE IND LTD [KR]

- TI - SIMULATING SYSTEM FOR TESTING A VARIOUS CONFIGURATION **UAV** USING A SCHEDULER AND CONTROLLING MEATHOD FOR THE SAME
- AB - The present invention provides a simulating system for verifying multi-device unmanned planes using a scheduler and a method for controlling the same, wherein the simulating system comprises: a first step of performing simulation functions of a **simulator** according to control command signals of a ground control station while a flight control computer interfaces with the **simulator** through an ITS; a second step of assigning model processes for each function of **simulator** models copying the functions of a flying object in corresponding CPUs by means of a scheduler after the first step; and a third step of independently performing management by generating timer events for tasks set by each CPU after the second step. In the present invention, a scheduler which is independently operated in the simulating system is equipped so that process-type operation models for each CPU or core are assigned in the CPUs or cores and flight simulation is dispersively performed. Accordingly, the real-time properties of the simulating system are maintained, and multi-device unmanned planes can be easily changed, so that the concentration of operations in one CPU is prevented and the real-time properties of overall simulation are remarkably improved thereby.

10/13 © EPODOC / EPO

- PN - [KR101236195B](#) B1 20130226
- PR - KR20120080299 20120724
- AP - KR20120080299 20120724
- DT - I
- CT - || STSE (B1)
[JP2010049051](#) A 20100304 [] (MITSUBISHI HEAVY IND LTD);
[JP2007093045](#) A 20070412 [] (MITSUBISHI ELECTRIC CORP);
[KR101083128B](#) B1 20111111 [] (KOREA AEROSPACE IND LTD [KR]);
[JP2012047866](#) A 20120308 [] (KAWASAKI HEAVY IND LTD)
- CNOI - [G09B5/02](#) ; [G06T17/05](#) ; [G09B9/42](#) ; [G09B19/165](#)
- PA - REPUBLIC OF KOREA THE ARMY CHIEF OF STAFF [KR]
- TI - **UAV** TRAINING **SIMULATOR** AND THE REAL-TIME SIMULATION METHOD AND SYSTEM FOR INTERWORKING
- AB - PURPOSE: A link method of a real-time unmanned spy plane image **simulator** and a training simulation and a system thereof are provided to uplift a fighting power of a group by solving all limitations for real-time link between a simulation and a **simulator**. CONSTITUTION: A **UAV** engine processor(10) comprises a **UAV** damage processing terminal(11), a troops data for transmitting terminal(12) generating the information of a fixed object and a moving object, and a **UAV** data receiving terminal(13) for processing the current location information of **UAV**. A **UAV** operator(20) transmits information processed in a **UAV** engine processor to a **UAV** control processor set through a computer network. A **UAV** operator controls the direction and angle of a **UAV** sensor and the screen size which can be zoomed in and out with a control and adjustment device(40) by determining a rule displayed through a **UAV** control processor. A **UAV** operator displays information which processes unit information in the screen size by a **UAV** engine processor on a **UAV** screen display part and inputs a configuration and connection information connecting with a **UAV** engine processor by using a setting part(24). An enlarged image display terminal(50) transmits the image of

a **UAV** screen display part through a remote image transmission group and displays the transmitted image. [Reference numerals] (10) **UAV** system; (100) Main model; (11) Developing a **UAV** damage processing terminal[citing existing information model logic]; (12) Transmitting GT[corps information] - generating fixed object, moving object information; (13) Receiving **UAV** information(such as location information); (AA) Command station; (BB) Image communication; (C1,C2,C3) Additional information; (D1, D2,DE) **UAV** state information; (EE) **UAV** simulation group

11/13 © EPODOC / EPO

PN - [CN102566441](#) A 20120711

PR - CN20111451653 20111229

AP - CN20111451653 20111229

DT - I

CT - || STSE (A)

[CN101118424](#) A 20080206 [A] (UNIV BEI HANG [CN])
[A]

[US2009256909](#) A1 20091015 [A] (NIXON STUART [AU])
[A]

[CN101241653](#) A 20080813 [A] (UNIV BEIJING AVIAT & SPACEFLI [CN])
[A]

[CN102109418](#) A 20110629 [A] (GUIZHOU AVIAT UAV INDUSTRY CO LTD)
[A]

[CN101504287](#) A 20090812 [A] (UNIV ZHEJIANG [CN])
[A]

[CN201266242Y](#) Y 20090701 [A] (AIR FORCE ENGINEERING UNIVERSI [CN])
[A]

[CN102205877](#) A 20111005 [A] (ANDI JIN)
[A]

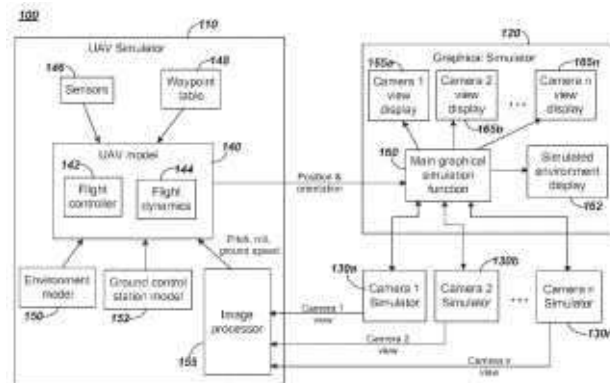
PA - CHENGDU AIRCRAFT IND GROUP CO

TI - Visual simulation test system for unmanned aerial vehicle (**UAV**)

AB - The invention provides a visual simulation test system for an unmanned aerial vehicle (**UAV**), and aims to provide a visual simulation test system which has a changeable visual angle and a visual display parameter, is zoomable, is clear in details and can reliably perform a simulation test. According to the technical scheme, the system comprises a real-time three-dimensional imaging computer system, a cylindrical screen imaging system, and visual display equipment, an inertial navigation/global positioning system (GPS)/magnetometer **simulator**, a gyro **simulator**, a ground detection **simulator** and a telecontrol telemetering **simulator** which are connected with one another through Ethernet and simultaneously connected with an integrated control cabinet respectively, a **UAV** mathematical model **simulator** which is electrically connected through an Ethernet router, and an air data computer/radio altimeter **simulator**, a total static pressure **simulator** (ADC) and a radio echo **simulator** (RA) which are electrically connected with the integrated control cabinet through the mathematical model **simulator**, wherein each **simulator** and each sensor send a signal to a flight control computer via the control cabinet through a respective electrical interface, and a **UAV** three-dimensional model and flight data thereof are displayed in real time.

12/13 © EPODOC / EPO

- PN - [US2011301925](#) A1 20111208
- PNFP - US8942964 B2 20150127
- PR - US20100796429 20100608
- AP - US20100796429 20100608
- DT - *; Rep
- CT - || STSE (B2)
[US2006074557](#) A1 20060406 [] (MULLIGAN ANTHONY C [US], et al)
[US2011106339](#) A1 20110505 [] (PHILLIPS EMILIE [US], et al)
[US2011273451](#) A1 20111110 [] (SALEMANN LEO J [US])
[US2011285590](#) A1 20111124 [] (WELLINGTON ROBERT J [US])
[US2011295569](#) A1 20111201 [] (HAMKE ERIC E [US], et al)
- || R141 (A1)
[US2006074557](#) A1 [];
[US2011106339](#) A1 [];
[US2011285590](#) A1 [];
[US2011295569](#) A1 [];
[US2011273451](#) A1 []
- CTNP - || STSE (B2)
[] Dusha et al. (Altitude estimation for a fixed-wing aircraft
using horizon detection and optical flow, 2007 (pp. 1-8)
[] Barjatya (Block matching algorithms for motion estimation,
2004 (pp. 1-6)
- || R141 (A1)
[] Dusha et al. (Altitude estimation for a fixed-wing aircraft
using horizon detection and optical flow, 2007 (pages 1-8)
[] Barjatya (Block matching algorithms for motion estimation,
2004 (pages 1-6)
- CCI - [G09B9/08](#) ; [G09B9/48](#)
- PA - (A1 B2)

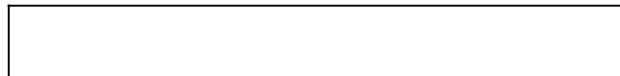


MCWILLIAMS III GEORGE T [US];
ALLEY KEVIN J [US]; MENTZER
CHRISTOPHER I [US]; SOUTHWEST
RES INST [US]

- TI - (A1 B2)
Optical State Estimation And
Simulation Environment For
Unmanned Aerial Vehicles
- AB - (A1 B2)
The present disclosure relates to
a method and system for
simulating an unmanned aerial
vehicle (**UAV**) and simulating an
environment in which the **UAV**
may be flying. A plurality of
visual sensors, e.g., cameras,
positioned on the **UAV**, may be
simulated. A **UAV simulator** is
configured to simulate the **UAV**
and a graphical **simulator** is
configured to simulate the
environment. The **UAV simulator**
may be configured to: estimate
pitch, roll and/or groundspeed
based, at least in part, on
outputs from the visual sensors,
determine a position and/or an
orientation of the simulated **UAV**
in the simulated environment
based, at least in part, on the
estimate(s) and provide the
position and/or orientation to
the graphical **simulator**. The
graphical **simulator** may be
configured to display the
simulated **UAV** at the position
and/or orientation in the
simulated environment and/or to
display the simulated camera
view(s).

13/13 © EPODOC / EPO

- PN - [KR100842105B](#) B1 20080630
- PR - KR20070058961 20070615
- AP - KR20070058961 20070615
- DT - I
- CT - || STSE (B1)



[JPH04151398](#) A 19920525 [
] (MITSUBISHI HEAVY IND LTD)

- PA - KOREAN AIR LINES CO LTD [KR]
- TI - VIRTUAL FLIGHT TEST METHOD
FOR SECURING DURABILITY
OF **UAV**
- AB - A flight simulation method for
securing reliability of a **UAV** is
provided to be capable of
checking normalcy of whole
system of the **UAV** by realizing
flight state of the **UAV** on the
ground. A flight simulation
method for securing reliability of
a **UAV** comprises the steps of:
driving a simulation actuator by
generating and transmitting pilot
command to the simulation
actuator(S110); calculating a
simulation feedback signal by
the simulation actuator and
transmitting the simulation
feedback signal to a real-time
simulation computer(S120);
transmitting the simulation
feedback signal combined with
virtual sensor information to a
flight control computer and
calculating flight movement
model about 6 degree of freedom
motion using the simulation
feedback signal(S130); realizing
flight movement for the flight
movement model in real time by
a 3-axis motion **simulator**(S140);
calculating real-time GPS(Global
Positioning System) information
using virtual GPS information
and measured posture
information and transmitting the
GPS information and measured
posture information(S150); and
updating the pilot command
based on the real-time GPS
information, the measured
posture information, the
simulation feedback signal, and
the simulation feedback signal.

