## PATENT ASSIGNMENT COVER SHEET

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| SUBMISSION TYPE:      | NEW ASSIGNMENT |
|-----------------------|----------------|
| NATURE OF CONVEYANCE: | ASSIGNMENT     |

#### **CONVEYING PARTY DATA**

| Name            | Execution Date |
|-----------------|----------------|
| YOUNGHYOUN KWON | 07/23/2014     |
| JIEUN CHOI      | 07/23/2014     |
| HUIRAE CHO      | 07/23/2014     |
| JAEKI LEE       | 07/23/2014     |
| HEESUN PARK     | 07/23/2014     |
| JINGAK JANG     | 07/23/2014     |
| JINHYUN KIM     | 07/23/2014     |
| JIEUN KIM       | 07/23/2014     |
| INHO HWANG      | 07/23/2014     |

#### **RECEIVING PARTY DATA**

| Name:           | ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE |  |
|-----------------|---|--|
| Street Address: | 161, GAJEONG-DONG, YUSEONG-GU                         |  |
| City:           | DAEJEON   |  |
| State/Country:  | KOREA, REPUBLIC OF                                    |  |
| Postal Code:    | 305-350   |  |

#### **PROPERTY NUMBERS Total: 1**

| Property Type       | Number   |
|---------------------|----------|
| Application Number: | 14466976 |

### **CORRESPONDENCE DATA**

Fax Number: (703)854-1332

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent

using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Phone: 7038541331

Email: mail@lrkpatent.com Correspondent Name: TAEKSOO LEE

Address Line 1: 1952 GALLOWS RD. SUITE 200 Address Line 4: VIENNA, VIRGINIA 22182-3823

| ATTORNEY DOCKET NUMBER: | P10784US      |
|-------------------------|---------------|
| NAME OF SUBMITTER:      | TAEKSOO LEE   |
| SIGNATURE:              | /TAEKSOO LEE/ |
|                         | PATENT        |

REEL: 034605 FRAME: 0051 503119952

| DATE SIGNED:                    | 12/31/2014 |
|---------------------------------|------------|
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# DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76) AND ASSIGNMENT FOR SINGLE ASSIGNEE

| Title of<br>Invention  | APPARATUS AND METHOD FOR ESTIMATING DIRECTION OF RADIO FREQUENCY SIGNAL  |  |  |
|--|--|--|--|
| As the below named inventor  | or, I hereby declare that:   |  |  |
| This declaration   The a   |  |  |  |
| · · · · · · · · · · · · · · · · · · ·  | ed States application or PCT international application number  |  |  |
| The above-identified applic  | ation was made or authorized to be made by me.   |  |  |
| I believe that I am the origin WHEREAS, ELECTRO  | nal inventor or an original joint inventor of a claimed invention in the application.  NICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE  |  |  |
| (hereinafter referred to as "  | ASSIGNEE"), whose post-office address is 161, Gajeong-dong, Yuseong-gu, Daejeon, 305-  |  |  |
| 350, Republic of Korea, is desirous of acquiring the entire right, title and interest for the United States and its territorial possessions in and to said invention and application, including any and all divisions and continuations thereof, and in and to any and all Letters Patent which may be granted therefor, including any and all renewals, reissues, and prolongations thereof.  |  |  |  |
| NOW, THIS WITNESSETH that for and in consideration of One Dollar (\$1.00) and other good and valuable consideration, the receipt whereof is hereby acknowledged, I hereby assign, sell and transfer to said ASSIGNEE, its assigns and legal representatives, the entire and exclusive right, title and interest in and to said invention and application, for the United States and its territorial possessions including any and all divisions and continuations thereof, and any and all Letters Patent which may be granted therefor, said ASSIGNEE and its assigns and legal representatives to have, hold, exercise and enjoy the said invention and application, including any and all divisions and continuations thereof, and any and all Letters Patent which may be granted thereon, including any and all renewals, reissues and prolongations thereof, with all the rights, powers, privileges, and advantages in any ways arising from or pertaining thereto, for and during the term or terms of any and all such Letters Patent when granted, including any and all renewals, reissues, and prolongations thereof, for the use and benefit of said ASSIGNEE and its assigns and legal representatives in as ample and beneficial a manner to all intents and purposes as I might or could have held and enjoyed the same, if this assignment had not been made. |  |  |  |
| I hereby agree to execute all papers necessary to file applications in the United States for said invention and to assign the same to said ASSIGNEE, or any assignee acquiring title to said invention, and to execute any other papers that may be needed in connection with filing said application and securing Letters Patent thereon.   |  |  |  |
| I hereby authorize and request the Commissioner of Patents to issue Letters Patent on said application, and on any and all divisions and continuations thereof, to said ASSIGNEE, its assigns and legal representatives, in accordance herewith.   |  |  |  |
|  | I hereby grant LRK Patent Law Firm the power to insert any further identification which may be necessary or desirable in order to comply with the rules of the U.S. Patent and Trademark Office. |  |  |
|  | hat any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by it more than five (5) years, or both.   |  |  |
| IN TESTIMONY WHE   | REOF, this assignment is executed by me, on the respective date(s) indicated below.  |  |  |

| LEGAL      | NAME OF INVENTOR |                      |
|------------|------------------|----------------------|
| Inventor:  | KWON, YoungHyoun | Date: 2014- Jul - 13 |
| Signature: | nlow             | <br>                 |

Check the box below and complete the attached page(s) to list additional inventors.

Additional inventors are being named on the 3 supplemental sheet(s) attached hereto.

LRK PATENT LAW FIRM 1952 Gallows Rd. Suite 200 Vienna, VA 22182 Telephone: 703-854-1331

| SUPPLEMENTAL SHEET  | FOR DECLARATION USING |
|---------------------|-----------------------|
| AN APPLICATION DATA | SHEET AND ASSIGNMENT  |

ADDITIONAL INVENTOR(S)
Supplemental Sheet

Page 1 of 3

| Legal Name of Joint Inventor, if any: |                 |  |
|---------------------------------------|-----------------|--|
| Inventor's<br>Name                    | CHOI, JiEun     |  |
| Inventor's<br>Signature               | mpms            |  |
| Date (Optional)                       | July 23, 2014   |  |
| Legal Name of Joint In                | ventor, if any: |  |
| Inventor's<br>Name                    | CHO, HuiRae     |  |
| Inventor's<br>Signature               | Clotin rue      |  |
| Date (Optional)                       | July 23, 2014   |  |
| Legal Name of Joint Inventor, if any: |                 |  |
| Inventor's<br>Name                    | LEE, Jaeki      |  |
| Inventor's<br>Signature               | Life            |  |
| Date (Optional)                       | July 23, 2014   |  |

| SUPPLEMENTAL SHI  | EET FOR | DECLARA   | TION USING |
|-------------------|---------|-----------|------------|
| AN APPLICATION DA | ATA SHE | ET AND AS | SIGNMENT   |

ADDITIONAL INVENTOR(S) Supplemental Sheet

Page 2 of 3

| Legal Name of Joint Inventor, if any: |                 |  |
|---------------------------------------|-----------------|--|
| Inventor's<br>Name                    | PARK, Heesun    |  |
| Inventor's<br>Signature               | 222             |  |
| Date (Optional)                       | July 23, 2014   |  |
| Legal Name of Joint Inv               | ventor, if any: |  |
| Inventor's<br>Name                    | JANG, Jingak    |  |
| Inventor's<br>Signature               | なべち             |  |
| Date (Optional)                       | July 23, 2014   |  |
| Legal Name of Joint Inventor, if any: |                 |  |
| Inventor's<br>Name                    | KIM, Jinhyun    |  |
| Inventor's<br>Signature               | 2) 21 年         |  |
| Date (Optional)                       | July 23, 2014   |  |

| SUPPLEMENTAL SHEET  | FOR DECLARATION USING |
|---------------------|-----------------------|
| AN APPLICATION DATA | SHEET AND ASSIGNMENT  |

ADDITIONAL INVENTOR(S)
Supplemental Sheet

Page 3 of 3

| Inventor's<br>Name      | KIM, Jieun           |  |
|-------------------------|----------------------|--|
| Inventor's<br>Signature | 2222                 |  |
| Date (Optional)         | July 23, 2014        |  |
| Legal Name of Joi       | nt Inventor, if any: |  |
| Inventor's<br>Name      | HWANG, Inho          |  |
| Inventor's<br>Signature | 如空                   |  |
| Date (Optional)         | July 23, 2014        |  |

PATENT REEL: 034605 FRAME: 0057

**RECORDED: 12/31/2014**