

**[126]** Vision Assisted User Clustering in mmWave/THz-NOMA Systems

Aditya Sriram Rajasekaran, Halim Yanikomeroglu, Hamza Sokun, Omar Maraqa, Saad Al-Ahmadi

○ **USA**

Provisional application no: 63/231597, application date: 10 August 2021

○ **WIPO | PCT**

Application no: PCT/IB2021/057455, application date: 12 August 2021

**[125]** Detector for Faster than Nyquist Transmitted Data Symbols

Ahmed Mohamed Ali Ibrahim, Ebrahim Bedeer Mohamed, Halim Yanikomeroglu.

○ **USA**

Provisional application no: 63/150,798, application date: 18 Feb 2021

**[124]** Deep Learning-based User Clustering in Millimeter Wave Non-Orthogonal Multiple Access Communications

Hamza Sokun, Aditya Sriram Rajasekaran, Omar Maraqa, Halim Yanikomeroglu, Saad Al-Ahmadi

○ **WIPO | PCT**

Application no: PCT/IB2020/062488, application date: 28 December 2020

**[123]** Enabling Wireless Network Personalization using Zone of Tolerance Modeling and Predictive Analytics

Rawan Alkurd, Halim Yanikomeroglu, Ibrahim Abualhaol

○ **USA**

Publication no: [US2021/0266781 A1](#), publication date: 26 August 2021 [[pdf](#)]

Application no: 17/188,683, application date: 01 March 2021

US provisional patent application no: 63/057,560, application date: 28 July 2020

US provisional patent application no: 62/724,195, application date: 29 August 2018

○ **EP**

Publication no: [EP3845023 A1](#), publication date: 07 July 2021

Application no: EP19856044.3A, application date: 29 August 2019

○ **CA**

Publication no: [CA3111030 A1](#), Publication date: 05 March 2020

Application no: CA3111030A, application date: 29 August 2019

○ **WIPO | PCT**: [WO2020/041883 A1](#) Publication date: 05 March 2020 [[pdf](#)]

Application no: PCT/CA2019/051197, application date: 29 August 2019

**[122]** System and Method for Providing Adaptive Synchronization of LTE Communications Systems

Amr El-Keyi, Halim Yanikomeroglu, Oktay Ureten, Trevor Noel Yensen

- **[P26]** [US 10,219,234 B2](#) – Patent date: 26 February 2019 [[pdf](#)]  
Publication no: US2018/0054787 A1, publication date: 22 February 2018  
Application no: 15/680,164, application date: 17 August 2017  
US provisional patent application no: 62/376,477, application date: 18 August 2016
- **[P24]** [CA 2,976,563 C](#) – Patent date: 04 September 2018 [[pdf](#)]  
Publication no: CA2976563 A1, publication date: 18 February 2018  
Application no: CA2976563, application date: 17 August 2017
- **[P38]** [GB 2,555,205 B](#) – Patent date: 21 July 2021 [[pdf](#)]  
Publication no: GB2555205 A, publication date: 25 April 2018  
Publication no: GB2017/13198 D0, publication date: 04 October 2017  
Application no: GB2017/13198 A, application date: 17 August 2017
- **[P39]** [AU 2017 216551 B2](#) – Patent date: 09 September 2021 [[pdf](#)]  
Publication no: AU2017216551 A1, publication date: 08 March 2018  
Application no: AU2017/216551, application date: 18 August 2017

**[I21]** Method for Determining an Encoding Scheme and Symbol Mapping

Ian Marsland, Reinhard Balogun, Ramy Gohary, Halim Yanikomeroglu, Ngoc Dung Dao, Nimal Gamini Senarath

- **[P37]** [US 10,623,142 B2](#) – Date of patent: 14 April 2020 [[pdf](#)]  
Publication no: US2017/0126354 A1, publication date: 04 May 2017  
Application no: 15/175,675, application date: 07 June 2016  
Provisional application no: 62/248,974, application date: 30 October 2015
- **WIPO | PCT:** [WO 2017/072597 A1](#) – Publication date: 04 May 2017 [[pdf](#)]  
Application no: PCT/IB2016/053413, application date: 09 June 2016

**[I20]** System and Method for Utilizing Multidimensional Constellations

Hossein Khoshnevis, Ian Marsland, Halim Yanikomeroglu, Ngoc Dung Dao, Nimal Gamini Senarath

- **[P34]** [US 10,433,187 B2](#) – Date of patent: 01 October 2019 [[pdf](#)]  
Publication no: US2016/0309344 A1, publication date: 20 October 2016  
Application no: 15/097,784, application date: 13 April 2016  
Provisional application no: 62/149,222, application date: 17 April 2015
- **WIPO | PCT:** [WO2016/166706 A1](#) – Publication date: 20 October 2016 [[pdf](#)]  
Application no: PCT/IB2016/052140, application date: 14 April 2016

**[I19]** System and Method for User Terminal-Aware Cell Switch-Off

Ibrahim Aydin, Ngoc Dung Dao, Nimal Gamini Senarath, Halim Yanikomeroglu

- **[P23]** [US 9,980,218 B2](#) – Granted on 22 May 2018 [[pdf](#)]

Publication no: US2016/0255581 A1, publication date: 01 September 2016  
Application no: 15/052,261, application date: 24 February 2016  
Provisional application no: 62/121,692, application date: 27 February 2015

- **WIPO | PCT:** [WO2016/134676 A1](#) – Publication date: 01 September 2016 [[pdf](#)]  
Application no: PCT/CN2016/074738, application date: 27 February 2016

#### [I18] System and Method for Wireless Load Balancing

Rainer Schoenen, Ziyang Wang, Halim Yanikomeroglu, Nimal Gamini Senarath, Ngoc-Dung Dao

- **[P17]** [US 9,642,039 B2](#) – Patent date: 02 May 2017 [[pdf](#)]  
Publication no: US2016/0050588 A1, publication date: 18 February 2016  
Application no: 14/643,636, application date: 10 March 2015  
Provisional patent application no: 62/036,801, application date: 13 August 2014

- **[P30]** [US 10,306,515 B2](#) – Patent date: 28 May 2019 [[pdf](#)]  
Publication no: US2017/0230866 A1, publication date: 10 August 2017  
Application no: 15/497,402, application date: 26 April 2017  
Provisional patent application no: 62/036,801, application date: 13 August 2014

- **WIPO | PCT:** [WO2016/023411 A1](#), publication date: 18 February 2016 [[pdf](#)]  
Application no: PCT/CN2015/084929, application date: 23 July 2015

#### [I17] System and Method for Multiple-Input Multiple-Output Communication

Ramy Gohary, Halim Yanikomeroglu

- **[P16]** [US 9,467,212 B2](#) – Patent date: 11 October 2016 [[pdf](#)]  
Publication no: US2015/0326284 A1, publication date: 12 November 2015  
Application no: 14/706,591, application date: 07 May 2015  
Provisional application no: 61/991,399, application date: 09 May 2014

- **[P29]** [CN 106,233,652 B](#) – Patent date: 28 May 2019 [[pdf](#)]  
Publication no: CN 106233652 A, publication date: 14 December 2016  
Application no: CN2015/80021970, application date: 08 May 2015

- **[P31]** [EP 3,103,209 B1](#) – Patent date: 26 June 2019 [[pdf](#)]  
Publication no: EP 3103209 A4, publication date: 22 March 2017  
Publication no: EP 3103209 A1, publication date: 14 December 2016  
Application number: EP2015/0788996, application date: 08 May 2015

- **WIPO | PCT:** [WO2015/169247 A1](#), publication date: 12 November 2015 [[pdf](#)]  
Application no: PCT/CN2015/078505, application date: 08 May 2015

#### [I16] System and Method for Grassmannian Signaling in a Broadband Network

Yaser Fouad, Ramy Gohary, Halim Yanikomeroglu, Hosein Nikopour

- **[P18]** [US 9,654,324 B2](#) – Patent date: 16 May 2017 [[pdf](#)]  
Publication no: US2015/0318970 A1, publication date: 05 November 2015

Application no: 14/702,220, application date: 01 May 2015  
Provisional application no: 61/987,995, application date: 02 May 2014

- **WIPO | PCT:** [WO2015/168628 A1](#), publication date: 05 November 2015 [[pdf](#)]  
Application no: PCT/US2015/028904, application date: 01 May 2015

**[I15]** System and Method for Random Access  
Jing Dang, Halim Yanikomeroglu, Nimal Gamini Senarath

- **[P35]** [US 10,476,834 B2](#) – Date of patent:12 November 2019 [[pdf](#)]  
Publication no: US2015/0264132 A1, publication date: 17 September 2015  
Application no: 14/644,959, application date: 11 March 2015  
Provisional application no: 61/951,371, application date: 11 March 2014
- **WIPO | PCT:** [WO 2015/138614 A1](#) – Publication date: 17 September 2015 [[pdf](#)]  
Application no: PCT/US2015/019982, application date: 11 March 2015

**[I14]** System and Method for Greedy-based Autonomous Resource Block Assignment Scheme for Cellular Networks with Self-Organizing Relaying Terminals  
Yaser Fouad, Ramy Gohary, Halim Yanikomeroglu, Gamini Senarath

- **[P13]** [US 9,288,679 B2](#) – Patent date: 15 March 2016 [[pdf](#)]  
Publication no: US2015/0031406 A1, publication date: 29 January 2015  
Application no: 14/340,322, application date: 24 July 2014  
Provisional application no: 61/858,480, application date: 25 July 2013
- **[P25]** [CN 105,359,605 B](#) – Patent date: 19 February 2019 [[pdf](#)]  
Publication no: CN 105359605 A, publication date: 24 February 2016  
Application no: CN2014/80036844, application date: 24 July 2014
- **WIPO | PCT:** [WO2015/013540 A1](#), publication date: 29 January 2015 [[pdf](#)]
- **WIPO | PCT:** [WO2015/013540 A8](#), publication date: 11 February 2016  
International application no: PCT/US2014/48069, application date: 24 July 2014

**[I13]** System and Method for Multi-Objective Cell Switch-Off in Wireless Networks  
David G. Gonzalez, Halim Yanikomeroglu, Nimal Gamini Senarath

- **[P19]** [US 9,730,153 B2](#) – Patent date: 08 August 2017 [[pdf](#)]  
Publication no: US 2015/0023163 A1, publication date: 22 January 2015  
Application no: 14/334,134, application date: 17 July 2014  
Provisional application no: 61/847,403, application date: 17 July 2013
- **[P22]** [EP 3,000,204 B1](#) – Patent date: 02 May 2018 [[pdf](#)]  
Publication no: EP3000204 A1, publication date: 30 Mar 2016  
Publication no: EP3000204 A4, publication date: 28 September 2016  
Application no: EP2014/0826725, application date: 17 July 2014

- **[P32]** [CN 105,531,963 B](#) – Patent date: 13 August 2019 [[pdf](#)]  
Publication no: CN 105531963 A, publication date: 27 April 2016  
Application no: CN2014/80037924, application date: 17 July 2014
- **WIPO | PCT:** [WO2015/009937 A1](#) – Publication date: 22 January 2015 [[pdf](#)]  
Application no: PCT/US2014/047041, application date: 17 July 2014

**[I12]** System and Method for Controlling Multiple Wireless Access Nodes  
Yegui Cai, Fei Richard Yu, Gamini Senarath, Halim Yanikomeroglu

- **[P15]** [US 9,451,611 B2](#) – Patent date: 20 September 2016 [[pdf](#)]  
Publication no: US2014/0355535 A1, publication date: 04 December 2014  
Application no: 14/292,483, application date: 30 May 2014  
Provisional application no: 61/829,469, application date: 31 May 2013
- **[P33]** [CN 105,379,412 B](#) – Patent date: 16 August 2019 [[pdf](#)]  
Publication no: CN 105379412 A, publication date: 02 March 2016  
Application no: CN2014/80030416, application date: 30 May 2014
- **WIPO | PCT:** [WO2014/194283 A1](#), publication date: 04 December 2014 [[pdf](#)]  
Application no: PCT/US2014/040373, application date: 30 May 2014

**[I11]** System and Method for Network Resource Allocation Considering User Experience, Satisfaction and Operator Interest  
Alireza Sharifian, Rainer Schoenen, Halim Yanikomeroglu, Gamini Senarath, Ho Ting Cheng, Petar Djukic

- **USA** – abandoned  
Publication no: [US2014/0229210 A1](#), publication date: 14 August 2014 [[pdf](#)]  
Application no: 14/181,160, application date: 14 February 2014  
Provisional application no: 61/764,903, application date: 14 February 2013  
Provisional application no: 61/764,895, application date: 14 February 2013
- **WIPO | PCT:** [WO2014/127280 A2](#), publication date: 21 August 2014 [[pdf](#)]
- **WIPO | PCT:** [WO2014/127280 A3](#), publication date: 09 October 2014  
Application no: PCT/US2014/016575, application date: 14 February 2014

**[I10]** System and Method for Charging Services Using Effective Quanta Units  
Rainer Schoenen, Halim Yanikomeroglu

- **[P21]** [US 9,911,106 B2](#) – Patent date: 06 March 2018 [[pdf](#)]  
Publication no: US2014/0195394 A1, publication date: 10 July 2014  
Application no: 14/141,143, application date: 26 December 2013  
Provisional application no: 61/749,584, application date: 07 January 2013
- **[P20]** [EP 2,941,845 B1](#) – Patent date: 28 February 2018 [[pdf](#)]  
Publication no: EP 2941845 A4, publication date: 09 December 2015  
Publication no: EP 2941845 A1, publication date: 11 November 2015

Application no: EP2014/0735233, application date: 03 January 2014

○ **[P28]** [CN 104,956,622 B](#) – Patent date: 12 April 2019 [[pdf](#)]  
Publication no: CN 104956622 A, publication date: 30 September 2015  
Application no: CN2014/80004160, application date: 03 January 2014

○ **WIPO | PCT:** [WO 2014/106476 A1](#) – Publications date: 10 July 2014 [[pdf](#)]  
Application no: PCT/CN2014/070095, application date: 03 January 2014

**[I09]** System and Methods to Achieve Optimum Efficiency-Jain Fairness in Wireless Systems  
Akram Bin Sediq, Ramy Gohary, Halim Yanikomeroglu, Gamini Senarath, Ho Ting Cheng

○ **[P14]** [US 9,369,925 B2](#) – Patent date: 14 June 2016 [[pdf](#)]  
Publication no: US2014/0120974 A1, publication date: 01 May 2014  
Patent application no: 14/067,542, application date: 30 October 2013  
Provisional application no: 61/720,230, application date: 30 October 2012

○ **[P27]** [CN 104,770,036 B](#) – Patent date: 08 March 2019 [[pdf](#)]  
Publication no: CN 104770036 A, publication date: 08 July 2015  
Application no: CN2013/80056529, application date: 30 October 2013

○ **WIPO | PCT:** [WO2014/070937 A1](#), publication date: 08 May 2014 [[pdf](#)]  
Application no: PCT/US2013/067589, application date: 30 October 2013

**[I08]** Inter-cell Interference Coordination for Wireless Communication Systems  
Akram Bin Sediq, Rainer Schoenen, Halim Yanikomeroglu, Gamini Senarath, Zhijun Chao, Ho Ting Cheng, Peiying Zhu

○ **[P10]** [US 9,042,933 B2](#) – Patent date: 26 May 2015 [[pdf](#)]  
Publication no: US2013/0095872 A1, publication date: 18 April 2013  
Application no: 13/438,624, application date: 03 April 2012  
Provisional application no: 61/547,506, application date: 14 October 2011

**[I07]** Resource Allocation Method and Device for Amplify-and-Forward Relay Network  
Alireza Sharifian, Petar Djukic, Halim Yanikomeroglu, Jietao Zhang

○ **[P03]** [US 8,477,679 B2](#) – Patent date: 02 July 2013 [[pdf](#)]  
Publication no: US2013/0028171 A1, publication date: 31 January 2013  
Application no: 13/633,498, application date: 02 October 2012

○ **[P07]** [CN 102,244,930 B](#) – Patent date: 30 April 2014 [[pdf](#)]  
Publication no: CN 102244930 A, publication date: 16 November 2011  
Application no: CN2010/10175925, application date: 13 May 2010

○ **WIPO | PCT:** [WO2011/140851](#), publication date: 17 November 2011 [[pdf](#)]  
Application no: PCT/CN2011/071416, application date: 01 March 2011

**[I06]** Data Transmission Method and System in Cooperative Relay Network, Intermediate Node and Source Node

Akram Salem Bin Sediq, Petar Djukic, Halim Yanikomeroğlu, Jietao Zhang

- **[P05]** [CN 102,237,988 B](#) – Patent date: 01 January 2014 [[pdf](#)]  
Publication no: CN 102237988 A, publication date: 09 November 2011  
Application no: CN2010/10159054.4, application date: 26 April 2010
- **WIPO | PCT:** [WO2011/134305 A1](#), publication date: 03 November 2011 [[pdf](#)]  
Application no: PCT/CN2011/071286, application date: 25 February 2011

**[I05]** Method for Relaying Data in Wireless Network and Personal Relay of Enabling the Method, and Mobile Device for Communicating with the Personal Relay

Young-Doo Kim, Mohamed Salem, Abdulkareem Adinoyi, Halim Yanikomeroğlu

- **[P11]** [KR 101,537,736 B1](#) – Patent date: 17 July 2015 [[pdf](#)]  
Publication no: KR2011/0026222 A, publication date: 15 March 2011  
Application no: KR2009/0084026, application date: 07 September 2009

**[I04]** Scheduling Apparatus and Method of Relay-Based Network

Young-Doo Kim, Mohamed Rashad Salem, Abdulkareem Adinoyi, Halim Yanikomeroğlu, David Falconer

- **[P04]** [US 8,565,144 B2](#) – Patent date: 23 October 2013 [[pdf](#)]  
Publication no: US2010/0232344 A1, publication date: 16 September 2010  
Application no: 12/567,776, application date: 27 September 2009
- **[P12]** [KR 101,542,152 B1](#) Patent date: 05 August 2015 [[pdf](#)]  
Publication no: KR2010/0104010 A, publication date: 29 September 2010  
Application no: KR2009/0022132, application date: 16 March 2009

**[I03]** Apparatus and Method for Allocating Subchannels and Controlling Interference in OFDMA Systems

Mohamed Rashad Salem, Abdulkareem Adinoyi, Mahmudur Rahman, Halim Yanikomeroğlu, David Falconer, Young-Doo Kim

- **[P01]** [US 8,339,975 B2](#) – Patent date: 25 December 2012 [[pdf](#)]  
Publication number: US2009/0310478 A1, publication date: 17 December 2009  
Application no: 12/341,933, application date: 22 December 2008
- **[P09]** [JP 5,691,103 B2](#) – Patent date: 01 April 2015 [[pdf](#)]  
Publication no: JP2013/258780 A, publication date: 26 December 2013  
Application no: ?, application date: 19 September 2013
- **[P06]** [JP 5,419,182 B2](#) – Patent date: 19 February 2014 [[pdf](#)]  
Publication no: JP2012/504876 A, publication date: 23 February 2012  
Application no: ?, application date: 23 April 2009

- **[P08]** [KR 101,469,143 B1](#) – Patent Date: 04 December 2014 [[pdf](#)]  
Publication no: KR2009/0128789 A, publication date: 16 December 2009  
Application no: KR2008/0054726, application date: 11 June 2008
- **[P36]** [EP 2,289,277 B1](#) – Patent date: 08 April 2020 [[pdf](#)]  
Publication no: EP 2289277 A4, publication date: 28 September 2016  
Publication no: EP 2289277 A2, publication date: 02 March 2011  
Application number: EP 20090762597, application date: 23 April 2009
- **WIPO | PCT:** [WO2009/151210 A2](#), publication date: 17 December 2009 [[pdf](#)]  
Publication no: WO2009/151210 A3; publication date: 17 November 2011  
Application no: PCT/KR2009/002119, application date: 23 April 2009

**[I02]** Method and Device for Estimating Channel Parameters (Verfahren und Vorrichtung zur Schätzung von Kanalparametern)

Stefan Valentin, Tobias Volkhausen, Holger Karl, Halim Yanikomeroglu, Furuzan Atay Onat

- **DE** – withdrawn  
Publication no: [DE 102008007113 A1](#), publication date: 06 August 2009 [[pdf](#)]  
Application no: DE2008/10007113, application date: 31 January 2008
- **WIPO | PCT:** [WO2009/095001 A2](#), publication date: 06 August 2009 [[pdf](#)]
- **WIPO | PCT:** [WO2009/095001 A3](#), publication date: 15 October 2009
- **WIPO | PCT:** [WO2009/095001 A8](#), publication date: 03 December 2009  
Application no: PCT/DE2009/00126, application date: 30 January 2009

**[I01]** Method and System for Capacity and Coverage Enhancement in Wireless Networks with Relays  
Shalini Periyalwar, Omer Mubarek, Halim Yanikomeroglu

- **[P02]** [US 8,478,283 B2](#) – Patent date: 02 July 2013 [[pdf](#)]  
Publication no: US2008/0260000 A1, publication date: 23 October 2008  
Application no: 11/664,135, application date: 29 March 2005  
Provisional application no: 61/421,704, application date: 29 September 2004
- **WIPO | PCT:** [WO2006/034578 A1](#), publication date: 06 April 2006 [[pdf](#)]  
Application no: PCT/CA2005/001475, application date: 29 September 2005