EXHIBIT A

U.S. Patent No. 9,713,428

’428 Claim Term	Plaintiffs’ Proposed Construction	Defendants’ Proposed Construction
“one of an image acquisition component, a photoplethysmographic (PPG) sensor and an electrocardiogram sensor” (all independent claims)	Plain meaning **Intrinsic Evidence:** ’428 Patent, 3:33-42; 10:1-34, 11:16-63; 17:6-18:46 **Extrinsic Evidence:** N/A	“The physiological indicator signal is obtained from one of a camera, one of a PPG sensor, and one of a ECG sensor” **Intrinsic Evidence:** PLTF_00003956-3980 (the ’428 Patent) at 1:36-62, 3:33-42, 10:1-34, 11:16-63; 17:6-18:46; FIGS. 1, 8; Abstract; claims 1, 16, 21, 24, 25, 28, 32, 37, 42. ’428 Patent’s file history at Notice of Allowance dated March 10, 2017; Declaration under 37 CFR 1.132 dated December 22, 2016; Office Action Response dated December 22, 2016; Office Action dated September 22, 2016. **Extrinsic Evidence:** *SuperGuide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 886 (Fed. Cir. 2004) (finding that “at least one of a desired program start time, a desired program end time, a desired program service, and a desired program type” means “at least one of a desired program start time, at least a desired program end time, at least a program service, and at least a desired program type.”)
“using only the measurements of one or more physiological parameters” (claims 1, 16, 32, 37 and 42)	Plain meaning **Intrinsic Evidence:**	“using exclusively the measurements of the physiological parameters calculated in the preceding obtain element”

’428 Claim Term	Plaintiffs’ Proposed Construction	Defendants’ Proposed Construction
	’428 Patent, 2:4-25; 3:33-42; 3:53-63; 4:9-53, 11:65-12:30, 17:1-50 **Extrinsic Evidence:** N/A	**Intrinsic Evidence:** PLTF_00003956-3980 (the ’428 Patent) at 2:4-14, 3:33-42, 3:53-63, 4:9-53, 11:65-12:30, 17:6-50; FIGS. 1, 1a-1b; claims 1, 16, 37, 42 ’428 Patent File History at Office Action Response dated January 24, 2014; Office Action dated March 21, 2014; Office Action Response dated July 7, 2016; Office Action Response dated March 1, 2016 **Extrinsic Evidence:** https://www.merriam-webster.com/dictionary/only

U.S. Patent No. 9,408,576

’576 Claim Term	Plaintiffs’ Proposed Construction	Defendants’ Proposed Construction
Claim 16 Preamble: A non-transitory computer usable medium having computer readable code embodied therein, the computer readable code, when executed in one or more processors, causing the one or more processors to:	Plain meaning **Intrinsic Evidence:** ’576 Patent, 12:62-67; 13:1-6; 16:1-19:41; Claims 1-20. ’576 Patent certified file history, PLTF00000886-1234, at: • 1087-1088 (Written Opinion of the International Searching Authority)	The preambles are limiting and require “detection of, and discrimination between, NSR (normal sinus rhythm), AF (atrial fibrillation), PVC (premature ventricular contractions), and PAC (premature atrial contractions).” **Intrinsic Evidence:** PLTF00000140-70 (’576 Patent), Abstract, 1:54-60, 2:35-57, 2:61-67, 3:11-12, 3:48-4:26, 4:27-59, 7:16-28, 7:46-52, 13:51-59, Fig. 1, Claims 1-15.

’576 Claim Term	Plaintiffs’ Proposed Construction	Defendants’ Proposed Construction
	• 1091-1098 (October 6, 2015 Non-Final Office Action) • 1114-1135 (Amendment and Response to Non-Final Office Action) • 1139-1144 (Notice of Allowance) **Extrinsic Evidence:** N/A	’576 patent file history, Non-Final Office Action dated October 6, 2015 (PLTF00000752-759), at 1-6. ’576 patent file history, Amendment and Response to Office Action dated January 5, 2016 (PLTF00000775-796), at 2-3, 5-6, 9, 13-21. ’576 patent file history, Notice of Allowance dated March 29, 2016 (PLTF00000800-805). **Extrinsic Evidence:** Claim Construction Order, Dkt. 121, *THE RESEARCH FOUNDATION FOR THE STATE UNIVERSITY OF NEW YORK, et al. v. SAMSUNG ELECTRONICS CO., LTD.*, et al., Case 2:23-cv-00141-RWS-RSP

U.S. Patent No. 9,986,921

’921 Claim Term	Plaintiffs’ Proposed Construction	Defendants’ Proposed Construction
Preambles: Claims 8-9 A non-transitory computer usable medium having computer readable code embodied therein, the computer readable code, when executed in one or more processors, causing the one or more processors to:	Plain meaning **Intrinsic Evidence:** ’921 Patent, Sheet 1, 16 (Figure 1, 11); 3:25-4:2; 6:57-7:3; 12:25-13:15; Claims 1-15. ’921 Patent certified file history, PLTF00001235-1590, at: • 1366-1374 (January 6, 2017 Non-Final Office Action) • 1372-1373	The preambles are limiting and require “detection of, and discrimination between, NSR (normal sinus rhythm), AF (atrial fibrillation), PVC (premature ventricular contractions), and PAC (premature atrial contractions).” **Intrinsic Evidence:** PLTF00000238-64 (’921 Patent), Abstract, 1:56-61, 2:36-56, 2:57-59, 2:63-3:24, 3:26-29, 4:12-5:23, 7:26-30, 8:20-27, Claims 1-9, Fig. 3. ’921 patent file history, Non-Final Office Action dated January 6, 2017 (PLTF00003212-3220), at 1-7.

’921 Claim Term	Plaintiffs’ Proposed Construction	Defendants’ Proposed Construction
	• 1385-1420 (Amendment and Response to Office Action) • 1422-1431 (April 14, 2017 Final Office Action) • 1434-1435 (June 12, 2017 Interview Summary) • 1438-1462 (Amendments and Remarks) • 1463-1484 (Amendment and Response to Final Office Action) • 1496-1499 (July 20, 2017 Advisory Action) • 1514-1520 (Notice of Allowance) • 1536-1548 (Amendment) • 1584-1588 (Amendment) **<u>Extrinsic Evidence:</u>** N/A	’921 patent file history, Amendment and Response to Office Action dated April 5, 2017 (PLTF00003231-3266), at 3-11, 13-17. ’921 patent file history, Final Office Action dated April 14, 2017 (PLTF00003268-3277), at 1-8. ’921 patent file history, Amendment and Response to Final Office Action dated June 12, 2017 (PLTF00003309-3334), at 2-14, 17-24. ’921 patent file history, Notice of Allowance dated January 18, 2018 (PLTF00003360-3366). ’921 patent file history, Corrected Notice of Allowance dated February 9, 2018 (PLTF00003376-3380). **<u>Extrinsic Evidence:</u>** N/A

U.S. Patent No. 10,278,647

’647 Claim Term	Plaintiffs’ Proposed Construction	Defendants’ Proposed Construction
“based on each of the at least one remaining candidate spectral peak retained having been discarded by the second discarding,	Not indefinite **<u>Intrinsic Evidence:</u>**	Indefinite **<u>Intrinsic Evidence:</u>**

’647 Claim Term	Plaintiffs’ Proposed Construction	Defendants’ Proposed Construction
reconstructing the current representation is based on the prior reconstructed representation; and based on at least one last candidate spectral peak remaining, the at least one last candidate spectral peak remaining not discarded by the second discarding, reconstructing the current representation is based on a selected candidate spectral peak selected from amongst the at least one last candidate spectral peak remaining having a closest corresponding frequency to the prior reconstructed representation's frequency relative to respective frequencies of each of the at least one last candidate spectral peak remaining.” (Claims 14, 48)	’647 Patent, Sheets 1-28 (Figures 1-23); 1:20-6:30; 11:30-37; 12:32-18:54; 20:20-45; 26:3-22; Claims 1-75. ’647 Patent certified file history, PLTF00001591-3137, at: • 2789-2796 (Written Opinion of the International Searching Authority) • 2820-2830 (April 18, 2018 Non-Final Office Action) • 2855-2880 (Amendment and Remarks) • 2886-2894 (October 22, 2018 Final Office Action) • 2910-2932 (Reply after Final Rejection) • 2935-2936 (Notice of Allowance) **Extrinsic Evidence:** N/A	PLTF00000001-58 (’647 patent) at 2:57-3:18, 16:4-17:23, Figs. 3A, 3B, 3C, Claims 1, 10, 13, 14, 35, 44, 47, 48. **Extrinsic Evidence:** N/A
“classifying the classification of the movement by comparing an amount of amplitude modulation in the second TFS computed to an amplitude modulation threshold,	Not indefinite **Intrinsic Evidence:**	Indefinite **Intrinsic Evidence:**

’647 Claim Term	Plaintiffs’ Proposed Construction	Defendants’ Proposed Construction
wherein the classification indicates whether the movement rises to a level of causing the motion artifacts based on a result of the comparing” / “classify the classification of the movement by comparing an amount of amplitude modulation in the second TFS computed to an amplitude modulation threshold, wherein the classification indicates whether the movement rises to a level causing the motion artifacts based on a result of the comparing” (Claims 19, 53, 72, 75)	’647 Patent, Sheets 1-7, 22 (Figure 1-5, 17); 1:20-6:29; 10:22-19:38; 34:30-35:18; 36:64-37:30; Claims 1-75. ’647 Patent certified file history, PLTF00001591-3137, at: • 2789-2796 (Written Opinion of the International Searching Authority) • 2820-2830 (April 18, 2018 Non-Final Office Action) • 2855-2880 (Amendment and Remarks) • 2886-2894 (October 22, 2018 Final Office Action) • 2910-2932 (Reply after Final Rejection) • 2935-2936 (Notice of Allowance) **<u>Extrinsic Evidence:</u>** N/A	PLTF00000001-58 (’647 patent) at 3:38-50, 12:33-13:26., 15:5-32, Figs. 3A, 3B, 3C, Claims 1, 19-23, 35, 53-58, 72, 75. **<u>Extrinsic Evidence:</u>** N/A

U.S. Patent No. 10,653,362

’362 Claim Term	Plaintiffs’ Proposed Construction	Defendants’ Proposed Construction
“noise quality index” (Claims 1, 3, 8, 10, 12, 17, 19)	Plain meaning **<u>Intrinsic Evidence:</u>** ’362 Patent, Sheets 4-9 (Figures 2-7); 1:26-5:40; 7:62-13:41; Claims 1-20. ’362 Patent certified file history, PLTF00003285-3808, at: • 3411-3427 (September 14, 2018 Non-Final Office Action) • 3541-3559 (Remarks) • 3572-3581 (Amendments) • 3593-3626 (Interview Summary, • Amendments and Remarks) • 3628-3629 (Notice of Allowance) • 3635-3648 (Examiner’s Amendment) • 3753-3760 (Notice of Allowance) **<u>Extrinsic Evidence:</u>** N/A	“a parameter that increases in value as noise of a signal increases” **<u>Intrinsic Evidence:</u>** ’362 patent (PLTF00000081-102), 3:24-32, 4:26-43, 5:6-26, 8:12-23, 8:40-51, 8:52-59, 9:5-35, 10:30-56, 11:11-21, 12:30-60, 12:61-13:13. ’362 patent (PLTF00000081-102), Claims 1, 3, 8, 10, 12, 17, 19. **<u>Extrinsic Evidence:</u>** N/A
“a difference in frequency between the first trace and the second and third trace[,]	Plain meaning **<u>Intrinsic Evidence:</u>**	“the difference in frequency between the fundamental HR trace and its harmonic traces computed as a sum of (1) the difference in frequency between the second trace and two

’362 Claim Term	Plaintiffs’ Proposed Construction	Defendants’ Proposed Construction
the difference in frequency referred to as a projected difference” (Claims 1, 10, 19)	’362 Patent, Sheets 1-9 (Figures 1-7); 1:26-5:40; 7:43-13:41; Claims 1-20. ’362 Patent certified file history, PLTF00003285-3808, at: • 3411-3427 (September 14, 2018 Non-Final Office Action) • 3541-3559 (Remarks) • 3572-3581 (Amendments) • 3593-3626 (Interview Summary, • Amendments and Remarks) • 3628-3629 (Notice of Allowance) • 3635-3648 (Examiner’s Amendment) • 3753-3760 (Notice of Allowance) **Extrinsic Evidence:** N/A	times the first trace and (2) the difference in frequency between the third trace and three times the first trace” **Intrinsic Evidence:** ’362 patent (PLTF00000081-102), 4:62-65, 8:12-23. ’362 patent (PLTF00000081-102), Claims 1, 10, 19. **Extrinsic Evidence:** N/A
“statistical learning method” (Claims 1, 2, 4, 8, 9, 10, 11, 13, 17, 18, 19, 20)	Plain meaning **Intrinsic Evidence:** ’362 Patent, 1:26-5:40; Claims 1-20.	“an algorithm that continuously adapts its structure as additional data is processed” **Intrinsic Evidence:**

’362 Claim Term	Plaintiffs’ Proposed Construction	Defendants’ Proposed Construction
	’362 Patent certified file history, PLTF00003285-3808, at: • 3411-3427 (September 14, 2018 Non-Final Office Action) • 3541-3559 (Remarks) • 3572-3581 (Amendments) • 3593-3626 (Interview Summary, • Amendments and Remarks) • 3628-3629 (Notice of Allowance) • 3635-3648 (Examiner’s Amendment) • 3753-3760 (Notice of Allowance) **Extrinsic Evidence:** N/A	’362 patent (PLTF00000081-102), 2:19-53, 3:21-32, 4:26-43, 5:13-17, 5:18-26, 9:36-10:27, 10:30-56. ’362 patent (PLTF00000081-102), Claims 1, 2, 4, 8, 9, 10, 11, 13, 17, 18, 19, 20. **Extrinsic Evidence:** SAM-SNY_00081786-2226, e.g., at SAM-SNY_00081793-94, SAMSNY_00081815-81858, SAMSNY_00082137-72 (James et al., *An Introduction to Statistical Learning*, Springer Texts in Statistics (2013), Preface, 15-58, 337-72.) SAM-SNY_00081747-85, e.g., at SAMSNY_00081747 (Bousquet et al., *Introduction to Statistical Learning Theory*, Machine Learning 2003 (2004) LNAI 3176, 175.) *See* SAM-SNY_00081415-746, e.g., at SAM-SNY_00081419-24, SAMSNY_00081570-722 (Vapnik, *The Nature of Statistical Learning Theory*, Statistics for Engineering and Information Science (1998), Prefaces, 138-290) (explaining different statistical learning methods and the theory behind them).
“Support Vector Machine (SVM)” (Claims 2, 4, 9, 11, 13, 18, 20)	Plain meaning **Intrinsic Evidence:** ’362 Patent, Sheets 6-7 (Figures 4-5); 1:26-5:40; 9:36-11:48; Claims 1-20. Christopher J.C. Burges, A Tutorial on Support Vector Machines for Pattern Recognition, which is incorporated by	“a process that takes a priori determined classification parameter values of clean and corrupted PPG segments as a training data set, finds support vectors among the training data set which maximize the margin (or the distance) between different classes, and then builds a decision boundary” **Intrinsic Evidence:** ’362 patent (PLTF00000081-102), 2:19-53, 3:21-22, 5:13-17, 9:36-10:27, 10:30-56.

’362 Claim Term	Plaintiffs’ Proposed Construction	Defendants’ Proposed Construction
	reference in the ’362 Patent in its entirety and for all purposes. ’362 Patent, 9:42-45. ’362 Patent certified file history, PLTF00003285-3808, at: • 3411-3427 (September 14, 2018 Non-Final Office Action) • 3541-3559 (Remarks) • 3572-3581 (Amendments) • 3593-3626 (Interview Summary, • Amendments and Remarks) • 3628-3629 (Notice of Allowance) • 3635-3648 (Examiner’s Amendment) • 3753-3760 (Notice of Allowance) **Extrinsic Evidence:** N/A	’362 patent (PLTF00000081-102), Claims 2, 4, 9, 11, 13, 18, 20. **Extrinsic Evidence:** SAM-SNY_00081308-20, e.g., at SAMSNY_ 00081308 (Chong et al., *Photoplethysmograph Signal Reconstruction Based on a Novel Hybrid Motion Artifact Detection–Reduction Approach. Part I: Motion and Noise Artifact Detection*,” Annals of Biomedical Eng. (Nov. 2014) 42(11), 2238.) SAM-SNY_00037718-29, e.g., at SAMSNY_00037721, SAM-SNY_00037722 (Yu et al., *A Method for Automatic Identification of Reliable Heart Rates Calculated From ECG and PPG Waveforms*, Journal of the American Medical Informatics Association (May 2006), 13:3, 312.) SAM-SNY_00081415-746, e.g., at SAM-SNY_00081419-24, SAMSNY_00081570-656, SAMSNY 00081699-722 (Vapnik, *The Nature of Statistical Learning Theory*, Statistics for Engineering and Information Science (1998), Prefaces, 138-224, 267-290.)
“a difference between the dominant frequency and a heart rate obtained from peak to peak intervals from the signal used as the PPG signal in a time domain, the difference between the	Plain meaning **Intrinsic Evidence:** ’362 Patent, Sheets 1-3 (Figures 1A-1D); 1:26-5:40; 7:43-8:59; Claims 1-20.	“a difference between the dominant frequency and the frequency of the heart rate obtained from peak to peak intervals from the signal used as the PPG signal in a time domain, wherein the signal used as the PPG signal is not itself a PPG signal” **Intrinsic Evidence:**

’362 Claim Term	Plaintiffs’ Proposed Construction	Defendants’ Proposed Construction
dominant frequency and the heart rate obtained from peak to peak intervals referred to as a heart rate frequency difference” (Claims 3, 8, 12, 17)	’362 Patent certified file history, PLTF00003285-3808, at: • 3411-3427 (September 14, 2018 Non-Final Office Action) • 3541-3559 (Remarks) • 3572-3581 (Amendments) • 3593-3626 (Interview Summary, Amendments and Remarks) • 3628-3629 (Notice of Allowance) • 3635-3648 (Examiner’s Amendment) • 3753-3760 (Notice of Allowance) **Extrinsic Evidence:** N/A	’362 patent (PLTF00000081-102), 4:66-5:5, 8:24-39. ’362 patent (PLTF00000081-102), Claims 3, 8, 12, 17. **Extrinsic Evidence:** N/A
“variable frequency complex demodulation” (Claims 7, 16)	Plain meaning **Intrinsic Evidence:** ’362 Patent, Sheets 5-8 (Figures 3, 4, 6); 1:26-5:40; 5:41-7:61; 8:60-13:31; Claims 1-20. ’362 Patent certified file history, PLTF00003285-3808, at:	“a method for estimating a time frequency spectrum (TFS) of a time varying signal comprising two phases: (1) constructing an initial TFS (iTFS) using fixed frequency complex modulation; and (2) using the centered frequencies of the iTFS to obtain even more accurate TFS.” **Intrinsic Evidence:** ’362 patent (PLTF00000081-102), 2:19-53, 6:29-44, 6:45-7:42, 7:43-61, 8:61-9:35, 11:22-48, 11:60-12:28, 12:30-60, 12:61-13:13.

’362 Claim Term	Plaintiffs’ Proposed Construction	Defendants’ Proposed Construction
	• 3411-3427 (September 14, 2018 Non-Final Office Action) • 3541-3559 (Remarks) • 3572-3581 (Amendments) • 3593-3626 (Interview Summary, • Amendments and Remarks) • 3628-3629 (Notice of Allowance) • 3635-3648 (Examiner’s Amendment) • 3753-3760 (Notice of Allowance) **Extrinsic Evidence:** N/A	SAM-SNY_00027284-307 (U.S. Patent Application Publication No. 2012/0190947), ¶¶ [0058]-[0065]. SAM-SNY_00032372-84 (Wang et al., *A High Resolution Approach to Estimating Time-Frequency Spectra and Their Amplitudes*, Ann Biomed Eng. (February 2006) 34(2):326 38.) ’362 patent (PLTF00000081-102), Claims 7, 16. ’362 patent file history, at Applicant’s Remarks December 11, 2018 (PLTF00005383-406), at 20-22. **Extrinsic Evidence:** SAM-SNY_00027377-86, e.g., at SAMSNY_00027378 (Chon et al., *Estimation of Respiratory Rate From Photoplethysmogram Data Using Time–Frequency Spectral Estimation*, IEEE Transactions on Biomedical Engineering (August 2009), 56:8, 2055.) SAM-SNY_00081294-307, e.g., at SAM-SNY_00081296 (Nam et. al., *Respiratory Rate Estimation from the Built-in Cameras of Smartphones and Tablets*, Annals of Biomedical Eng. (Nov. 2013), 42(4), 887.)
“time frequency spectrum” (claims 1, 5, 6, 7, 8, 10, 14, 16, 17 and 19)	Plain meaning **Intrinsic Evidence:** ’362 Patent, 1:26-5:40; 6:30-44; 7:62-13:41, claims 1, 5, 6, 7, 8, 10, 14, 16, 17 and 19	“The high-resolution representation of a signal’s frequency content over time, achieved through the TVOPS-VFCDM technique” **Intrinsic Evidence:**

’362 Claim Term	Plaintiffs’ Proposed Construction	Defendants’ Proposed Construction
	’362 Patent certified file history, PLTF00003285-3808, at: • 3411-3427 (September 14, 2018 Non-Final Office Action) • 3541-3559 (Remarks) • 3572-3581 (Amendments) • 3593-3626 (Interview Summary, • Amendments and Remarks) • 3628-3629 (Notice of Allowance) • 3635-3648 (Examiner’s Amendment) • 3753-3760 (Notice of Allowance) **Extrinsic Evidence:** N/A	’362 patent (PLTF00000081-102), 6:30-44 **Extrinsic Evidence:** https://pubmed.ncbi.nlm.nih.gov/16463086
“weights being selected such that each weighted factor represents less than a predetermined percentage of power in an uncorrupted segment” (claims 1, 8, 10, 17 and 19)	Plain meaning **Intrinsic Evidence:** ’362 Patent, 1:26-5:40; 6:30-44; 7:62-13:41, claims 1, 8, 10, 17 and 19 ’362 Patent certified file history, PLTF00003285-3808, at: • 3411-3427 (September 14, 2018 Non-Final Office Action) • 3541-3559 (Remarks)	“The weighted factor predetermined percentage is 5%, and a typical MNA-free PPG segment should not have noiseQI greater than 0.15” **Intrinsic Evidence:** ’362 patent (PLTF00000081-102), 8:49-51 ’362 patent (PLTF00000081-102), 9:8-14 **Extrinsic Evidence:**

’362 Claim Term	Plaintiffs’ Proposed Construction	Defendants’ Proposed Construction
	• 3572-3581 (Amendments) • 3593-3626 (Interview Summary, • Amendments and Remarks) • 3628-3629 (Notice of Allowance) • 3635-3648 (Examiner’s Amendment) • 3753-3760 (Notice of Allowance) **Extrinsic Evidence:** N/A	
“dominant frequency” (claims 1, 3, 8, 10, 12, 17 and 19)	Plain meaning **Intrinsic Evidence:** ’362 Patent, 1:26-5:40; 6:30-44; 7:62-13:41; 7:47-50, claims 1, 3, 8, 10, 12, 17 and 19 ’362 Patent certified file history, PLTF00003285-3808, at: • 3411-3427 (September 14, 2018 Non-Final Office Action) • 3541-3559 (Remarks) • 3572-3581 (Amendments) • 3593-3626 (Interview Summary, • Amendments and Remarks) • 3628-3629 (Notice of Allowance)	“Determined exclusively from the dominant frequency in the PPG segment termed f_{HR}” **Intrinsic Evidence:** ’362 patent (PLTF00000081-102), 7:47-50 **Extrinsic Evidence:**

’362 Claim Term	Plaintiffs’ Proposed Construction	Defendants’ Proposed Construction
	• 3635-3648 (Examiner’s Amendment) • 3753-3760 (Notice of Allowance) **<u>Extrinsic Evidence:</u>** N/A	