CLAIMS:

1. A system for time-frequency separation based on image analysis of one or more spectrograms of multiple radio signals received over time from one or more emitters, the system comprising a processing circuitry configured to:

determine, using image analysis, a region of at least one of the spectrograms containing representations of a superposition of two or more overlapping radio signals of the radio signals, the overlapping radio signals being representations of radio signals sharing a common time-frequency within the at least one of the spectrograms;

decompose the superposition of the two or more overlapping radio signals within the region into separate signal representations, wherein each given separate signal representation of the separate signal representations is expressed by a corresponding bounding box around the given separate signal representation; and

perform, utilizing the separate signal representations, one or more actions.

2. The system of claim 1, wherein: (a) the processing circuitry is further configured to determine, for at least one separate signal representation of the separate signal representations, one or more parameters based on the corresponding bounding box; and (b) the one or more actions are performed also based on the parameters.

3. The system of claim 2, wherein the parameters of the separate signal representation include one or more of:

(a) wavelength;

(b) frequency;

(c) rise time;

(d) fall time;

(e) duration;

(f) power;

(g) occupied bandwidth;

(h) spectral density;

(i) activity profile; or

(j) polarization.

4. The system of claim 2, wherein the processing circuitry is further configured to:

generate, upon decomposing the superposition of the two or more overlapping radio signals, a plurality of additional spectrograms of the multiple radio signals, wherein: (a) a first additional spectrogram of the additional spectrograms has a first resolution, (b) a second additional spectrogram of the additional spectrograms has a second resolution, and (c) the first resolution is different from the second resolution; and

determine, for at least one given separate signal representation of the separate signal representations, one or more fine-tuned parameters of the given separate signal representation utilizing the additional spectrograms and the corresponding parameters, having a better accuracy than an accuracy of the corresponding parameters.

5. The system of claim 1, wherein the image analysis of the spectrograms of the multiple radio signals received over time is performed continuously or periodically.

6. The system of claim 5, wherein the processing circuitry is further configured to determine, upon decomposing the superposition of the two or more overlapping radio signals, one or more statistical parameters associated with at least one given separate signal representation of the separate signal representations, based on previous occurrences of the given separate signal representation within the spectrograms.

7. The system of claim 6, wherein the statistical parameters include one or more of:

(a) signal activity level;

(b) probability of occurrence;

(c) probability of interception;

(d) power distribution;

(e) frequency stability; or

(f) average duration.

8. The system of claim 1, wherein the actions include one or more of:

(a) identify the emitters that emitted the overlapping radio signals;

(b) classify the emitters that emitted the overlapping radio signals;

(c) generate a compressed representation of the multiple radio signals received over time;

(d) extract samples of the overlapping radio signals, thereby enabling radio signal analysis;

(e) provide the overlapping radio signals to one or more external systems; or

(f) provide the overlapping radio signals to a user of the system.

9. The system of claim 1, wherein the decomposition of the superposition of the overlapping radio signals is based on Rectilinear Polygon Decomposition (RPD).

10. The system of claim 1, wherein the determination of the region is also based on a band of the multiple radio signals received over time.

11. The system of claim 1, wherein the region is determined by identifying a bounding box around the region.

12. A method for time-frequency separation based on image analysis of one or more spectrograms of multiple radio signals received over time from one or more emitters, the method comprising:

determining, by a processing circuitry, using image analysis, a region of at least one of the spectrograms containing representations of a superposition of two or more overlapping radio signals of the radio signals, the overlapping radio signals being representations of radio signals sharing a common time-frequency within the at least one of the spectrograms;

decomposing, by the processing circuitry, the superposition of the two or more overlapping radio signals within the region into separate signal representations, wherein each given separate signal representation of the separate signal representations is expressed by a corresponding bounding box around the given separate signal representation; and

performing, by the processing circuitry, utilizing the separate signal representations, one or more actions.

13. The method of claim 12, further comprising: determining, by the processing circuitry, for at least one separate signal representation of the separate signal representations, one or more parameters based on the corresponding bounding box; and wherein the one or more actions are performed also based on the parameters.

14. The method of claim 13, wherein the parameters of the separate signal representation include one or more of:

(a) wavelength;

(b) frequency;

(c) rise time;

(d) fall time;

(e) duration;

(f) power;

(g) occupied bandwidth;

(h) spectral density;

(i) activity profile; or

(j) polarization.

15. The method of claim 13, further comprising:

generating, by the processing circuitry, upon decomposing the superposition of the two or more overlapping radio signals, a plurality of additional spectrograms of the multiple radio signals, wherein: (a) a first additional spectrogram of the additional spectrograms has a first resolution, (b) a second additional spectrogram of the additional spectrograms has a second resolution, and (c) the first resolution is different from the second resolution; and

determining, by the processing circuitry, for at least one given separate signal representation of the separate signal representations, one or more fine-tuned parameters of the given separate signal representation utilizing the additional spectrograms and the corresponding parameters, having a better accuracy than an accuracy of the corresponding parameters.

16. The method of claim 12, wherein the image analysis of the spectrograms of the multiple radio signals received over time is performed continuously or periodically.

17. The method of claim 16, further comprising determining, upon decomposing the superposition of the two or more overlapping radio signals, one or more statistical parameters associated with at least one given separate signal representation of the separate signal representations, based on previous occurrences of the given separate signal representation within the spectrograms.

18. The method of claim 17, wherein the statistical parameters include one or more of:

(a) signal activity level;
(b) probability of occurrence;
(c) probability of interception;
(d) power distribution;
(e) frequency stability; or
(f) average duration.

19. The method of claim 12, wherein the actions include one or more of:

(a) identify the emitters that emitted the overlapping radio signals;
(b) classify the emitters that emitted the overlapping radio signals;
(c) generate a compressed representation of the multiple radio signals received over time;
(d) extract samples of the overlapping radio signals, thereby enabling radio signal analysis;
(e) provide the overlapping radio signals to one or more external systems; or
(f) provide the overlapping radio signals to a user of the system.

20. A non-transitory computer readable storage medium having computer readable program code embodied therewith, the computer readable program code, executable by at least one processing circuitry of a computer to perform a method for time-frequency

separation based on image analysis of one or more spectrograms of multiple radio signals received over time from one or more emitters, the method comprising:

determining, by a processing circuitry, using image analysis, a region of at least one of the spectrograms containing representations of a superposition of two or more overlapping radio signals of the radio signals, the overlapping radio signals being representations of radio signals sharing a common time-frequency within the at least one of the spectrograms;

decompose, by the processing circuitry, the superposition of the two or more overlapping radio signals within the region into separate signal representations, wherein each given separate signal representation of the separate signal representations is expressed by a corresponding bounding box around the given separate signal representation; and

perform, by the processing circuitry, utilizing the separate signal representations, one or more actions.