**CLAIMS**

1. A medical imaging system comprising:

a first gantry having a plurality of first detector units coupled within a bore of the first gantry, wherein the first detector units form a first field of view (FOV) of the first gantry, the first detector units configured to acquire Single Photon Emission Computed Tomography (SPECT);

a second gantry having a plurality of second detector units coupled within a bore of the second gantry, wherein the second detector units form a second FOV of the second gantry, the second detector units configured to acquire x-ray computed tomography (CT) data, the second gantry positioned adjacent to the first gantry;

a common bore along an examination axis through the first and second gantries;

a patient table movable through the common bore of the first and second gantry along the examination axis; and

a controller unit configured to control a rotation speed of the first detector units and the second detector units around the examination axis.

2. The medical imaging system of claim 1, wherein the rotation speed of the first detector units are less than the rotation speed of the second detector units.

3. The medical imaging system of claim 1, wherein a collimator is coupled to at least one of the plurality of first detector units, the plurality of first detector units individually movable including translational movement towards or away from the patient table and when in an imaging position the plurality of first detector units are configured for rotational movement along a sweep range traverse to the patient table.

4. The medical imaging system of claim 1, wherein the plurality of first detector units are positioned to form an iris or linear configuration.

5. The medical imaging system of claim 1, wherein an edge of the first FOV and an edge of the second FOV are less than 50 cm apart.

6. The medical imaging system of claim 1, wherein an edge of the first FOV and an edge of the second FOV are less than 40 cm apart.

7. The medical imaging system of claim 1, wherein an edge of the first FOV and an edge of the second FOV are less than 30 cm apart.

8. The medical imaging system of claim 1, wherein the first gantry comprises a plurality of arms that move radially inward or outward relative to the common bore of the first gantry, wherein the first detector units are coupled to the plurality of arms.

9. The medical imaging system of claim 1, wherein the first gantry is positioned in front of the second gantry such that the patient table moves within the first FOV before entering the second FOV when moving along the examination axis.

10. The medical imaging system of claim 1, wherein the second gantry is positioned in front of the first gantry such that the patient table moves within the second FOV before entering the first FOV when moving along the examination axis.

11. The medical imaging system of claim 1, wherein the first and second gantries are formed from a common housing.

12. A medical imaging system comprising:

a gantry defining a housing and having a bore therethrough;

a patient table movable through the bore along an examination axis;

a plurality of detector units coupled within the bore, wherein a collimator is coupled to at least one of the plurality of detector units, the plurality of detector units individually movable including translational movement towards or away from the patient table and when in an imaging position the plurality of detector units are configured for rotational movement along a sweep range traverse to the patient table;

at least one x-ray source and at least one x-ray detector unit coupled within the bore, wherein the x-ray detector unit is configured to acquire x-ray data; and

a controller configured to control movement of the gantry and to control movement of the plurality of detector units including both the translational movement and the rotational movement to acquire Single Photon Emission Computed Tomography (SPECT) data from the plurality of detector units and x-ray computed tomography (CT) data from the x-ray detector unit.

13. The medical imaging system of claim 12, further comprising a plurality of arms configured to move radially inward or outward relative to the bore, wherein the plurality of detector units are coupled to the plurality of arms.

14. A method of obtaining a multimodality image of a patient, the method comprising:

providing a nuclear medicine-computer tomography (NM-CT) multimodality imaging system having a gap between a field of view (FOV) of NM detectors and a FOV of CT detector of less than 50 cm; and

acquiring a CT image and an NM image of a patient, wherein the acquiring of the CT image and the NM image of the patient is performed without repositioning the patient with respect to the patient table, and wherein the CT image and the NM image overlap over at least 120 cm along a length of the patient.