

WHAT IS CLAIMED IS:

1. A system for determination of the boundaries of a parcel, comprising a computational device and a parcel boundary calculator operated by said computational device, for calculating a centroid comprising two dimensional boundary measures and altitude;
 2. ~~The system of claim 1,~~ wherein said parcel boundary is determinable for a parcel located on a unit of land featuring a plurality of parcels, wherein at least one parcel of the plurality of parcels is located above ground level;
 3. ~~The system of claim 2,~~ wherein said unit of land comprises a building and wherein said plurality of parcels is located within said building, said building being divided into a plurality of building units, each building unit corresponding to a parcel, wherein at least two building units are owned by separate entities;
- the system further comprising a blockchain node for storing a distributed ledger, wherein the centroid is securely and verifiably stored on the blockchain node and wherein the blockchain node is in communication with the computational device through a computer network; and
- a second computational device in communication with the computer network, for accessing the centroid through communication with the blockchain node for performing verification of said boundaries and said altitude for said building unit; wherein the second computational device is configured to perform a title search according to at least one parameter of the parcel through communication with the blockchain node, wherein title information is stored on the blockchain node; wherein the distributed ledger is a permissioned blockchain, further comprising a trusted node for determining validity of a title to the parcel; wherein said trusted node determines said validity according to execution of a smart contract; and
- wherein upon request for verification of boundaries and altitude of a building unit of said plurality of building units, the centroid is read from the distributed ledger to confirm said boundaries and said altitude.
42. The system of ~~any of claims 1-3,~~ wherein the centroid is calculated as a single three dimensional (3D) centroid.

53. The system of ~~any of claims 1-3~~, wherein the centroid is calculated as a two dimensional centroid and then the third dimension is calculated separately.
6. ~~The system of any of the above claims, further comprising a blockchain node for storing a distributed ledger, wherein the centroid is stored on the blockchain node and wherein the blockchain node is in communication with the computational device through a computer network.~~
7. ~~The system of claim 6, further comprising a second computational device in communication with the computer network, for accessing the centroid through communication with the blockchain node.~~
8. ~~The system of claim 7, wherein the second computational device is configured to perform a title search according to at least one parameter of the parcel through communication with the blockchain node, wherein title information is stored on the blockchain node.~~
9. ~~The system of any of claims 6-8, wherein the distributed ledger is a permissioned blockchain, further comprising a trusted node for determining validity of a title to the parcel.~~

- ~~104.~~ The system of claim ~~91~~, wherein an owner of the parcel has a private key and wherein said private key is configured to permit transfer of ownership of the parcel, wherein said transfer is recorded on the distributed ledger through the blockchain node by providing the private key to said first or second computational devices.
- ~~115.~~ The system of claim ~~104~~, further comprising a smart contract stored on the distributed ledger, wherein transfer of the ownership of the parcel is performed through execution of the smart contract through the blockchain node by providing the private key to said first or second computational devices; and
- ~~12.~~ ~~The system of any of claims 6-11~~, configured as a decentralized MLS (Multiple Listings Service).
- ~~136.~~ The system of ~~any of claims 6-125~~, wherein the distributed ledger records Longitude, Latitude, Altitude for each property and wherein the first computational device is configured to record Longitude, Latitude, Altitude when adding a property to the distributed ledger; and
- ~~14.~~ ~~The system of any of claims 6-13~~, wherein the distributed ledger records Property Right Type, wherein said property right type is selected from the group consisting of fee simple absolute property rights, leasehold estate, life estate, easement, lien, or another encumbrance, and wherein the first computational device is configured to record Property Right Type when adding a property to the distributed ledger; and
- ~~15.~~ ~~The system of any of claims 6-14~~, wherein the distributed ledger records Property Status, wherein Property Status is selected from the group consisting of sold, active market listing, pending sale, active court contingent listing, and active release clause, expired listing, or withdrawn or canceled listing, and wherein the first computational device is configured to record Property Status when adding a property to the distributed ledger; and
- ~~16.~~ ~~The system of claim 15~~, wherein the first computational device is configured to record a change to Property Status in the distributed ledger upon execution of said change through a smart contract.
- ~~177.~~ The system of ~~any of claims 6-16~~, further comprising a plurality of smart contracts stored on the distributed ledger and a plurality of computational devices, wherein a transaction for a parcel is mediated through said plurality of smart contracts, wherein

said plurality of computational devices invoke said plurality of smart contracts through the distributed ledger, wherein said plurality of smart contracts relate to at least a plurality of parties to said transaction, wherein said plurality of parties is selected from the group consisting of: Buyer, Seller, Lender, Title Company, Escrow Company, Appraiser, and Broker.

188. The system of ~~any of claims 6-177~~, wherein the distributed ledger records a type of property, wherein said type of property is selected from the group consisting of Hotel, Office, Land, SFR, Retail, Industrial, and wherein the first computational device is configured to record said Property Type when adding a property to the distributed ledger;
- ~~19. The system of any of claims 6-18, wherein the distributed ledger records a value transfer in local fiat currency for a transaction for said parcel, and wherein the first computational device is configured to record said value transfer on the distributed ledger when a transaction is executed;~~
- ~~20. The system of any of claims 6-19, further comprising an external database, wherein the distributed ledger records an IPFS hash or smart contract header address for said parcel to link to said external database, and wherein the first computational device is configured to record said IPFS hash or smart contract header address on the distributed ledger for said parcel;~~
- ~~21. The system of any of claims 6-20, further comprising an additional blockchain, wherein the distributed ledger records an indicator of which blockchain has relevant information for said parcel, and wherein the first computational device is configured to record said indicator for said parcel on the distributed ledger; and~~
- ~~22. The system of any of claims 6-21, wherein said first computational device executes a change to the distributed ledger by invoking a smart contract.~~
239. A method for determining the boundaries of a parcel, the method being performed by a computational device, the method comprising calculating a centroid comprising two dimensional boundary measures and altitude, wherein said parcel boundary is determinable for one or more units on a parcel;
wherein the method is performed with a system for determination of the boundaries of a parcel, comprising a computational device, a parcel boundary calculator operated by said computational device for calculating a centroid comprising two dimensional boundary measures and altitude, and

a blockchain node for storing a distributed ledger, wherein the centroid is stored on the blockchain node and wherein the blockchain node is in communication with the computational device through a computer network;

wherein said parcel boundary is determinable for a parcel located on a unit of land featuring a plurality of parcels, wherein at least one parcel of the plurality of parcels is located above ground level;

wherein said unit of land comprises a building and wherein said plurality of parcels is located within said building, said building being divided into a plurality of building units, each building unit corresponding to a parcel, wherein at least two building units are owned by separate entities;

the system further comprising a second computational device in communication with the computer network, for accessing the centroid through communication with the blockchain node for performing verification of said boundaries and said altitude for said building unit;

wherein the second computational device is configured to perform a title search according to at least one parameter of the parcel through communication with the blockchain node, wherein title information is stored on the blockchain node;

wherein the distributed ledger is a permissioned blockchain, further comprising a trusted node for determining validity of a title to the parcel;

wherein said trusted node determines said validity according to execution of a smart contract; and

wherein upon request for verification of boundaries and altitude of a building unit of said plurality of building units, the centroid is read from the distributed ledger to confirm said boundaries and said altitude.

24. ~~The method of claim 23, performed with the system of any of the above claims.~~

- ~~25~~10. The method of claims ~~23 or 24~~9, wherein the centroid is calculated as a single three dimensional (3D) centroid.
- ~~26~~11. The method of claims ~~23 or 24~~9, wherein the centroid is calculated as a two dimensional centroid and then the third dimension is calculated separately.
- ~~27~~. ~~The method of any of claims 23-26, wherein said unit of land comprises a building and wherein said plurality of parcels is located within said building, said building being divided into a plurality of building units, each building unit corresponding to a parcel, wherein at least two building units are owned by separate entities.~~
- ~~28~~12. The method of ~~any of the above claims~~9, further comprising storing the boundaries on a distributed ledger, said distributed ledger being operated through a plurality of computational devices;
- ~~29~~. ~~The method of claim 28, further comprising performing title analysis of a title of a parcel stored on said distributed ledger, said performing said title analysis further comprising calculating said centroid to determine said boundaries of said parcel;~~
- ~~30~~. ~~The method of claim 29, wherein said performing said title analysis of said title further comprises determining proof of ownership;~~ and
- ~~31~~. ~~The method of claims 29 or 30, further comprising performing transfer of said parcel through said distributed ledger.~~
- ~~32~~13. The method of ~~any of claims 28-31~~12, further comprising title analysis on said distributed ledger using a "point in polygon" test to determine previous transactions in the chain of title.
- ~~33~~14. The method of ~~any of the above claims~~13, further comprising using biometric data in place of a private key for controlling transactions by an owner through said distributed ledger;
- ~~34~~. ~~The method of any of the above claims, providing, in a permissioned based implementation, further comprising providing a trusted node and overriding control by a current owner of a parcel by said trusted node;~~
- ~~35~~. ~~The method of claim 34, further comprising inducing transfer of said parcel by said trusted node;~~ and

36. ~~The method of claims 34 or 35, further comprising providing a plurality of trusted nodes and overriding control by said current owner of said parcel upon instruction by said plurality of trusted nodes.~~
15. The system of claim 1, wherein said verification is performed by comparing said calculation of said centroid to coordinates as described on a land plat and to a physical location of said building unit vertically within said building.