WHAT IS CLAIMED IS:

1. A method (200) for constructing a robotic arm (104) comprising:

positioning (202) a wire (120) in a formation zone (124) for the robotic arm (104); and

forming (206) a body (126) of the robotic arm (104) in the formation zone (124) around the wire (120) such that the body (126) of the robotic arm (104) encloses at least a portion of the wire (120).

2. The method (200) of claim 1, wherein positioning (202) the wire (120) in the formation zone (124) for the robotic arm (104) comprises positioning (204) a plurality of wires (120) in the formation zone (124) in tension such that the plurality of wires (120) in the formation zone (124) are suspended within the formation zone (124).

3. The method (200) of claim 1, wherein forming (206) the body (126) of the robotic arm (104) around the wire comprises forming (208) the body (126) of the robotic arm (104) around the wire (120) using an additive manufacturing process.

4. The method (200) of claim 1, wherein the wire (120) is a pre-sleeved wire having a sleeve (150) enclosing the wire (120).

5. The method (200) of claim 4, wherein forming (20) the body (126) of the robotic arm (104) around the wire (120) comprises forming (216) the body (126) of the robotic arm (104) around the sleeve (150) in a fixed manner such that the sleeve (150) is fixed relative to the body (126).

6. The method (200) of claim 1, wherein an anchor (122) is coupled to the wire (120), and wherein forming (206) the body (126) of the robotic arm (104) around the wire (120) further comprises forming (218) the body (126) of the robotic arm (104) around the anchor (122).

7. The method (200) of claim 6, wherein positioning (202) the wire (120) in the formation zone (124) comprises holding (220) the wire (120) at least partially in place through a positioning line (148) attached to the anchor (122), and wherein the method (200) further comprises:

removing (222) the positioning line (148) attached to the anchor (122) subsequent to forming the body (126) of the robotic arm (104) in the formation zone (124) around the wire (120).

8. The method (200) of claim 1, wherein forming (206) the body (126) of the robotic arm (104) around the wire (120) such that the body (126) of the robotic arm (104) encloses at least a portion of the wire (120) comprises forming (212) a plurality of links (116) of the body (126) of the robotic arm (104) and a plurality of joints (118) movably coupling the plurality of links (116).

9. The method (200) of claim 8, wherein each link (116) of the plurality of links (116) encloses at least a portion of the wire (120).

10. The method (200) of claim 8, wherein the plurality of links (116) and the plurality of joints (118) are formed together using an additive manufacturing process.

11. The method (200) of claim 1, wherein the wire (120) is a control wire, and wherein forming (206) the body (126) of the robotic arm (104) around the wire (120) comprises forming (214) the body (126) of the robotic arm (104) around the control wire (120) such that the control wire (120) is moveably positioned within at least a portion of the body (126) of the robotic arm (104) enclosing the control wire (120).

12. The method (200) of claim 11, wherein forming (214) the body (126) of the robotic arm (104) in the formation zone (124) around the wire (120) comprises forming (224) a forward link (116A), an aft link (116B), and a joint (118) moveably coupling the forward link (116A) and aft link (116B) such that the control wire (120) is moveably positioned within the aft link (116B) and fixed to the forward link

~~(116A).~~

~~13. The method (200) of claim 12, wherein an anchor (122) is coupled to the control wire (120), and wherein forming (214) the body (126) of the robotic arm (104) in the formation zone (124) around the wire (120) further (226) comprises forming the forward link (116A) around the anchor (122) to at least partially enclose the anchor (122).~~

~~14. The method (200) of claim 1, further comprising:~~

~~positioning (228) a tensile member (152) in the formation zone (124) for the robotic arm (104), and wherein forming the body (126) of the robotic arm (104) around the wire (120) comprises forming the body (126) of the robotic arm (104) around the tensile member (152).~~

1. A method for constructing a robotic arm comprising:

positioning a plurality of wires in a formation zone for the robotic arm; and

forming a body of the robotic arm in the formation zone around the plurality of wires such that the body of the robotic arm encloses at least a portion of each of the plurality of wires and defines a plurality of openings with each wire in the plurality of wires extending through at least one respective opening of the plurality of openings,

wherein the plurality of wires comprises one or more control wires,

wherein forming the body of the robotic arm around the plurality of wires comprises forming the body of the robotic arm around the one or more control wires such that the one or more control wires are moveably positioned within at least a portion of the body of the robotic arm enclosing the one or more control wires,

wherein forming the body of the robotic arm around the one or more control wires comprises forming the body of the robotic arm around the one or more control wires using an additive manufacturing process, wherein the additive manufacturing process comprises building up successive layers of additive materials, and wherein the additive materials comprise at least one of plastic, metal, ceramic, polymer, epoxy, and photopolymer resin,

wherein forming the body of the robotic arm around the plurality of wires such that the body of the robotic arm encloses at least a portion of the plurality of wires comprises forming a plurality of links of the body of the robotic arm and a plurality of joints movably coupling the plurality of links, and

wherein each control wire of the one or more control wires terminates at a corresponding link in the plurality of links, wherein a first control wire of the one or more control wires terminates at a first link of the plurality of links and a second control wire of the one or more control wires terminates at a second link of the plurality of links.

2. The method of claim 1, wherein positioning the plurality of wires in the formation zone for the robotic arm comprises positioning the plurality of wires in the formation zone in tension such that the plurality of wires in the formation zone are suspended within the formation zone.

3. The method of claim 1, wherein each link of the plurality of links encloses at least a portion of one of the wires in the plurality of wires.

4. The method of claim 1, wherein the plurality of links and the plurality of joints are formed together using the additive manufacturing process.

5. The method of claim 1, further comprising:

positioning a tensile member in the formation zone for the robotic arm, and wherein forming the body of the robotic arm around the plurality of wires comprises forming the body of the robotic arm around the tensile member.

6. The method of claim 1, wherein forming the body of the robotic arm around the plurality of wires comprises forming the body of the robotic arm to have an outer diameter less than about one inch.

7. The method of claim 1, wherein forming the body of the robotic arm around the plurality of wires comprises forming the body of the robotic arm to have an outer diameter less than about 0.5 inches.

8. The method of claim 1, wherein forming the body of the robotic arm around the plurality of wires comprises forming the body of the robotic arm to have a length of at least about five feet.

9. The method of claim 1, wherein forming the body of the robotic arm around the plurality of wires comprises forming a first portion of the body of the robotic arm and forming a second portion of the body of the robotic arm, and wherein positioning the plurality of wires in the formation zone for the robotic arm comprises laying the plurality of wires on the first portion of the body of the robotic arm prior to forming the second portion of the body of the robotic arm.

10. The method of claim 1, wherein the additive materials further comprise at least one of pure metals, nickel alloys, chrome alloys, titanium, titanium alloys, magnesium, magnesium alloys, aluminum, aluminum alloys, nickel-based superalloys, and cobalt-based superalloys.

11. The method of claim 1, wherein one of the plurality of wires is a pre-sleeved wire having a sleeve enclosing the wire.

12. The method of claim 11, wherein forming the body of the robotic arm around the plurality of wires comprises forming the body of the robotic arm around the sleeve in a fixed manner such that the sleeve is fixed relative to the body.

13. The method of claim 1, wherein forming the body of the robotic arm in the formation zone around the plurality of wires comprises forming a forward link, an aft link, and a joint moveably coupling the forward link and the aft link such that at least one of the one or more control wires is moveably positioned within the aft link and fixed to the forward link.

14. The method of claim 13, wherein one or more anchors are coupled to the one or more control wires, and wherein forming the body of the robotic arm in the formation zone around the plurality of wires further comprises forming the forward link around at least one of the one or more anchors to at least partially enclose at least one of the one or more anchors.

15. A method for constructing a robotic arm comprising:

positioning a plurality of wires in a formation zone for the robotic arm; and

forming a body of the robotic arm in the formation zone around the plurality of wires such that the body of the robotic arm encloses at least a portion of each of the plurality of wires and defines a plurality of openings with each wire in the plurality of wires extending through at least one respective opening of the plurality of openings,

wherein the plurality of wires comprises one or more control wires,

wherein forming the body of the robotic arm around the plurality of wires comprises forming the body of the robotic arm around the one or more control wires such that the one or more control wires are moveably positioned within at least a portion of the body of the robotic arm enclosing the one or more control wires,

wherein forming the body of the robotic arm around the one or more control wires comprises molding a continuous component around the plurality of wires, and removing sequential portions of the continuous component to form a plurality of individual links moveably coupled by a plurality of joints, and

wherein each control wire of the one or more control wires terminates at a corresponding link in the plurality of individual links, wherein a first control wire of the one or more control wires terminates at a first link of the plurality of individual links and a second control wire of the one or more control wires terminates at a second link of the plurality of individual links.

16. The method of claim 15, wherein the plurality of individual links of the body of the robotic arm encloses the plurality of wires.

17. A method for constructing a robotic arm comprising:

positioning a wire in a formation zone for the robotic arm, wherein an anchor is coupled to the wire;

holding the wire at least partially in place through a positioning line attached to the anchor;

forming a body of the robotic arm in the formation zone around the wire such that the body of the robotic arm encloses at least a portion of the wire, wherein forming the body of the robotic arm around the wire further comprises forming the body of the robotic arm around the anchor and enclosing the anchor; and

removing the positioning line attached to the anchor subsequent to forming the body of the robotic arm in the formation zone around the wire.

18. The method of claim 17, wherein the wire is a plurality of control wires, wherein a plurality of anchors are coupled to the plurality of control wires, wherein forming the body of the robotic arm in the formation zone around the wire comprises forming a plurality of links such that the plurality of anchors are fixedly positioned within the respective links of the body, and wherein forming the body of the robotic arm in the formation zone around the wire further comprises defining a plurality of openings with each wire in the plurality of control wires extending through at least one respective opening of the plurality of openings.

19. A method for constructing a robotic arm comprising:

positioning a plurality of wires in a formation zone for the robotic arm;

forming a body of the robotic arm in the formation zone around the plurality of wires such that the body of the robotic arm encloses at least a portion of each of the plurality of wires and defines a plurality of openings with each wire in the plurality of wires extending through at least one respective opening of the plurality of openings,

wherein the plurality of wires comprises one or more control wires, and

wherein forming the body of the robotic arm around the plurality of wires comprises forming the body of the robotic arm around the one or more control wires such that the one or more control wires are moveably positioned within at least a portion of the body of the robotic arm enclosing the one or more control wires;

holding a first plurality of ends of the one or more control wires using a first jig assembly; and

holding a second plurality of ends of the one or more control wires using a second jig assembly.

20. The method of claim 19, wherein forming the body of the robotic arm around the one or more control wires comprises forming the body of the robotic arm around the one or more control wires using an additive manufacturing process, wherein the additive manufacturing process comprises building up successive layers of additive materials, and wherein the additive materials comprise at least one of plastic, metal, ceramic, polymer, epoxy, and photopolymer resin.

21. The method of claim 19, wherein forming the body of the robotic arm around the wire comprises molding a continuous component around the plurality of wires, and removing sequential portions of the continuous component to form individual links moveably coupled by a plurality of joints.