CLAIMS

What is claimed is:

1. A method of optimizing an energy exerted on a performer falling from an elevated platform and impacting an airbag, the method comprising:

determining a weight of a performer to fall from an elevated platform toward an airbag;

measuring a distance between the elevated platform and the airbag;

setting an air pressure of the airbag based on the weight and the distance prior to the performer falling toward the airbag;

determining, while the performer falls toward the airbag, a velocity the performer will reach upon impact with the airbag; and

adjusting the air pressure of the airbag based on the velocity while the performer falls toward the airbag to optimize an energy exerted on the performer when the performer impacts the airbag.

2. The method of claim 1, wherein the setting the air pressure comprises:

calculating a theoretical velocity the performer will reach upon impact with the airbag based on the distance;

calculating a theoretical energy exerted on the performer upon impact with the airbag based on the weight and the theoretical velocity; and

setting the air pressure of the airbag based on the theoretical energy prior to the performer falling toward the airbag to optimize the energy exerted on the performer when the performer impacts the airbag.

3. The method of claim 2, wherein the air pressure is set to a pressure value within a range of pressure values for optimizing the energy exerted on the performer when the performer impacts the airbag.

4. The method of claim 2, wherein the adjusting the air pressure comprises:

determining while the performer falls toward the airbag whether the velocity is different from the theoretical velocity;

calculating a predicted energy exerted on the performer upon impact with the airbag based on the weight and the velocity if the velocity is different from the theoretical velocity; and

adjusting the air pressure of the airbag based on the predicted energy while the performer falls toward the airbag.

5. The method of claim 4, wherein the air pressure is adjusted to a pressure value within a range of pressure values for optimizing the energy exerted on the performer when the performer impacts the airbag.

6. The method of claim 1, wherein the adjusting the air pressure comprises:

detecting whether the performer is misaligned with a target area of the airbag while the performer falls toward the airbag;

determining a predicted area of the airbag where the performer will impact the airbag based on the performer being misaligned with the target area; and

adjusting the air pressure of the airbag at the predicted area while the performer falls toward the airbag.

7. The method of claim 6, wherein the air pressure at the predicted area is adjusted to a pressure value within a range of pressure values for optimizing the energy exerted on the performer when the performer impacts the predicted area.

8. An airbag system for optimizing an energy exerted on a performer falling from an elevated platform and impacting an airbag, the airbag system comprising:

an airbag configured to sustain an air pressure;

a scale;

one or more sensors;

an air compressor;

one or more outlet valves; and

a control system communicatively coupled to the airbag, the scale, the one or more

sensors, the air compressor, and the one or more outlet valves, the control system the control system configured to:

determine a weight of the performer to fall from an elevated platform toward the airbag,

measure a distance between the elevated platform and the airbag,

set an air pressure of the airbag based on the weight and the distance prior to the performer falling toward the airbag,

determine, while the performer falls toward the airbag, a velocity the performer will reach upon impact with the airbag, and

adjust the air pressure of the airbag based on the velocity while the performer falls toward the airbag to optimize an energy exerted on the performer when the performer impacts the airbag.

9. The airbag system of claim 8, wherein the control system configured to set the air pressure is configured to:

calculate a theoretical velocity the performer will reach upon impact with the airbag based on the distance;

calculate a theoretical energy exerted on the performer upon impact with the airbag based on the weight and the theoretical velocity; and

set the air pressure of the airbag based on the theoretical energy prior to the performer falling toward the airbag to optimize the energy exerted on the performer when the performer impacts the airbag.

10. The airbag system of claim 9, wherein the air pressure is set to a pressure value within a range of pressure values for optimizing the energy exerted on the performer when the performer impacts the airbag.

11. The airbag system of claim 9, wherein the control system configured to adjust the air pressure is configured to:

determine whether the velocity is different from the theoretical velocity;

calculate a predicted energy exerted on the performer upon impact with the airbag based

on the weight and the velocity if the velocity is different from the theoretical velocity; and

adjust the air pressure of the airbag based on the predicted energy while the performer falls toward the airbag.

12. The airbag system of claim 11, wherein the air pressure is adjusted to a pressure value within a range of pressure values for optimizing the energy exerted on the performer when the performer impacts the airbag.

13. The airbag system of claim 8, wherein the control system configured to adjust the air pressure is configured to:

detect whether the performer is misaligned with a target area of the airbag while the performer falls toward the airbag;

determine a predicted area of the airbag where the performer will impact the airbag based on the performer being misaligned with the target area; and

adjust the air pressure of the airbag at the predicted area while the performer falls toward the airbag.

14. The airbag system of claim 13, wherein the air pressure at the predicted area is adjusted to a pressure value within a range of pressure values for optimizing the energy exerted on the performer when the performer impacts the predicted area.

15. The airbag system of claim 13, wherein the control system comprises:

a scale configured to determine the weight of the performer to fall from the elevated platform toward the airbag;

one or more of a laser range finder, an optical sensor, a lidar sensor, or a radar sensor configured to:

measure the distance between the elevated platform and the airbag, and determine the velocity the performer will reach upon impact with the airbag; or

an anemometer configured to monitor at least one of a wind velocity or a wind direction of wind engaging the performer while the performer falls toward the airbag.

16. An airbag control system for optimizing an energy exerted on a performer falling from an elevated platform and impacting an airbag, comprising:

at least one processor; and

a memory coupled to the at least one processor, wherein the at least one processor and the memory are configured to:

determine a weight of the performer, via a scale, to fall from an elevated platform toward an airbag,

measure a distance between the elevated platform and the airbag,

set an air pressure of the airbag based on the weight and the distance prior to the performer falling toward the airbag,

determine, via one or more sensors, while the performer falls toward the airbag, a velocity the performer will reach upon impact with the airbag, and

adjust the air pressure of the airbag, via an air compressor and one or more outlet valves, based on the velocity while the performer falls toward the airbag to optimize an energy exerted on the performer when the performer impacts the airbag.

17. The airbag control system of claim 16, wherein the at least one processor and the memory configured to set the air pressure are configured to:

calculate a theoretical velocity the performer will reach upon impact with the airbag based on the distance;

calculate a theoretical energy exerted on the performer upon impact with the airbag based on the weight and the theoretical velocity; and

set the air pressure of the airbag based on the theoretical energy prior to the performer falling toward the airbag to optimize the energy exerted on the performer when the performer impacts the airbag.

18. The airbag system of claim 17, wherein the at least one processor and the memory configured to adjust the air pressure are configured to:

determine whether the velocity is different from the theoretical velocity;

calculate a predicted energy exerted on the performer upon impact with the airbag based on the weight and the velocity if the velocity is different from the theoretical velocity; and

adjust the air pressure of the airbag based on the predicted energy while the performer falls toward the airbag.

19. The airbag system of claim 18, wherein the air pressure is adjusted to a pressure value within a range of pressure values for optimizing the energy exerted on the performer when the performer impacts the airbag.

20. The airbag system of claim 16, wherein the at least one processor and the memory configured to adjust the air pressure are configured to:

detect whether the performer is misaligned with a target area of the airbag while the performer falls toward the airbag;

determine a predicted area of the airbag where the performer will impact the airbag based on the performer being misaligned with the target area; and

adjust the air pressure of the airbag at the predicted area while the performer falls toward the airbag.