WHAT IS CLAIMED IS:

1. A method for training a set of parameters of a predictive computer model, the method comprising:

identifying a set of images captured by a set of cameras while affixed to one or more first vehicles, wherein a first camera of the set of cameras is affixed to the first vehicles according to a particular configuration;

for each image in the set of images, identifying a training output for the image;

for one or more images in the set of images, generating an augmented image for a set of augmented images by:

generating an augmented image for a set of augmented images by modifying the image with an image manipulation function that maintains camera properties of the image, such that angle, scale, and/or pose associated with the image is preserved, and

associating the augmented training image with the training output of the image;

training the set of parameters of the predictive computer model to predict the training output based on an image training set including the images and the set of augmented images,

wherein the trained predictive computer model is configured to predict a presence of objects in input images for use in autonomous or semi-autonomous control of a second vehicle, the vehicle having a second camera affixed to the vehicle according to the particular configuration.

2. The method of claim 1, wherein the particular configuration indicates a same position and/or orientation with respect to the first vehicles and the second vehicle, and wherein consistent image characteristics are included in images captured by the first camera and the second camera.

3. The method of claim 1, wherein the image training set does not include images generated by image manipulation functions that modify camera properties of an image, such image manipulation functions including at least one of crop, pad, horizontal or vertical flip, or affine transformations.

4. The method of claim 1, wherein the image manipulation function is cutout, hue, saturations, value jitter, salt and pepper, domain transfer or any combination thereof.

5. The method of claim 1, wherein the image manipulation function is a cutout applied to the image, wherein a location of the cutout is selected based on an expected view of the first camera with respect to the first vehicles, and wherein the location includes a center of the image which depicts a direction of travel.

6. The method of claim 1, wherein the image manipulation function is a cutout applied to a portion of the image, wherein a location of the cutout is selected based on an expected view of the first camera with respect to the first vehicles, and wherein the location includes artifacts which are always present in images captured by the first camera according to the particular configuration.

7. The method of claim 1, wherein the image manipulation function is a cutout applied to a portion of the image that partially overlaps with the location of the training output in the image, the cutout being a solid color and the cutout being blended with regions near the cutout.

8. A system comprising one or more processors and non-transitory computer storage media storing instructions that when executed by the one or more processors, cause the processors to perform operations comprising:

identifying a set of images captured by a set of cameras while affixed to one or more first vehicles, wherein a first camera of the set of cameras is affixed to the first vehicles according to a particular configuration;

for each image in the set of images, identifying a training output for the image;

for one or more images in the set of images, generating an augmented image for a set of augmented images by:

generating an augmented image for a set of augmented images by modifying the image with an image manipulation function that maintains camera properties of the image, such that angle, scale, and/or pose associated with the image is preserved, and

associating the augmented training image with the training output of the image;

training the set of parameters of the predictive computer model to predict the training output based on an image training set including the images and the set of augmented images,

wherein the trained predictive computer model is configured to predict a presence of objects in input images for use in autonomous or semi-autonomous control of a second vehicle, the vehicle having a second camera affixed to the vehicle according to the particular configuration.

9. The system of claim 8, wherein the particular configuration indicates a same position and/or orientation with respect to the first vehicles and the second vehicle, and wherein consistent image characteristics are included in images captured by the first camera and the second camera.

10. The system of claim 8, wherein the image manipulation function is cutout, hue, saturations, value jitter, salt and pepper, domain transfer or any combination thereof.

11. The system of claim 8, wherein the image manipulation function is a cutout applied to a portion of the image, wherein a location of the cutout is selected based on an expected view of the first camera with respect to the first vehicles, and wherein the location includes artifacts which are always present in images captured by the first camera according to the particular configuration.

12. A non-transitory computer-readable medium having instructions for execution by a processor, the instructions when executed by the processor causing the processor to:

identify a set of images captured by a set of cameras while affixed to one or more first vehicles, wherein a first camera of the set of cameras is affixed to the first vehicles according to a particular configuration;

for each image in the set of images, identify a training output for the image;

for one or more images in the set of images, generate an augmented image for a set of augmented images by:

generate an augmented image for a set of augmented images by modifying the image with an image manipulation function that maintains camera properties of the image, such that angle, scale, and/or pose associated with the image is preserved, and

associate the augmented training image with the training output of the image;

train the computer model to learn to predict the training output based on an image training set including the images and the set of augmented images,

wherein the trained predictive computer model is configured to predict a presence of objects in input images for use in autonomous or semi-autonomous control of a second vehicle, the vehicle having a second camera affixed to the vehicle according to the particular configuration,

and wherein the particular configuration indicates a same position and/or orientation with respect to the first vehicles and the second vehicle, and wherein consistent image characteristics are included in images captured by the first camera and the second camera.

13. The non-transitory computer-readable medium of claim 12, wherein the image manipulation function is a cutout applied to a portion of the image, wherein a location of the cutout is selected based on an expected view of the first camera with respect to the first vehicles, and wherein the location includes artifacts which are present in images captured by the first camera according to the particular configuration.

14. The non-transitory computer-readable medium of claim 12, wherein the image manipulation function is a cutout applied to a portion of the image, wherein a location of the cutout is selected based on an expected view of the first camera with respect to the first vehicles, and wherein the location includes artifacts which are always present in images captured by the first camera according to the particular configuration.

15. The non-transitory computer-readable medium of claim 12, wherein the image manipulation function is a cutout applied to a region that partially overlaps with the location of the training output in the image, the cutout being a solid color and the cutout being blended with regions near the cutout.