



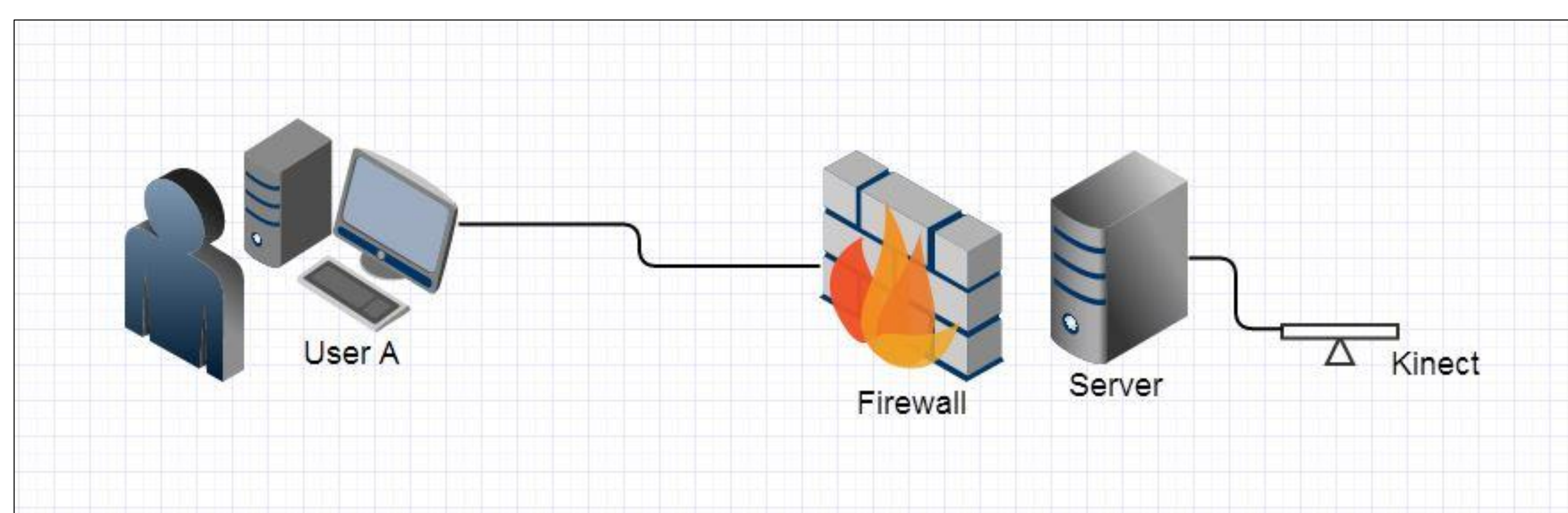
Kinect Development Through a Virtual Laboratory

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Abstract

We present our first prototype of a virtual laboratory that allows students in different regions of our country to learn, remotely, how to program Kinect applications.

General Scheme

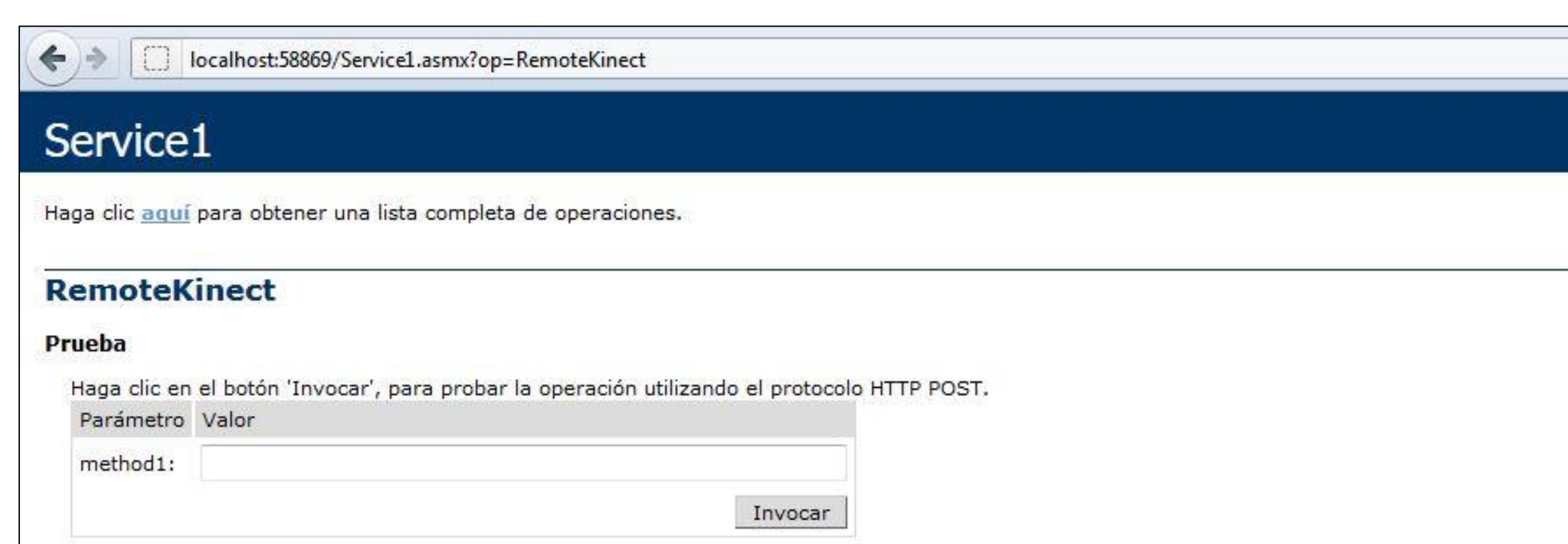


Server

```
public Skeleton Skeleton ( get; set; )
{
    // Summary
    // Summary
    float previousDistanceClap = 0.0f;
    float previousDistanceClap = 0.0f;
    float previousDistanceClap = 0.0f;
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    float previousDistanceClap = 0.0f;
}
// Summary
// Starts the recognition.
public void StartRecognition()
{
    switch (this.gestureType)
    {
        case GestureType.HandClapping:
            this.HandClappingGesture(this.Skeleton);
            break;
            // ...
    }
}
// Sets the joint distance.
// Summary
// Operates "firstJoint" the first joint.
// Operates "secondJoint" the second joint.
// Returns the distance.
private float GetDistance(Joint firstJoint, Joint secondJoint)
{
    float distance = firstJoint.Position.X - secondJoint.Position.X;
    float distance = firstJoint.Position.Y - secondJoint.Position.Y;
    float distance = firstJoint.Position.Z - secondJoint.Position.Z;
    return (float)Math.Sqrt(Math.Pow(distance, 2) + Math.Pow(distance, 2));
}
// Detects the hand clapping gesture.
// Summary
// Operates "Skeleton" the skeleton.
// TO DO
private void PatchHandClappingGesture(Skeleton skeleton) { }
```

User

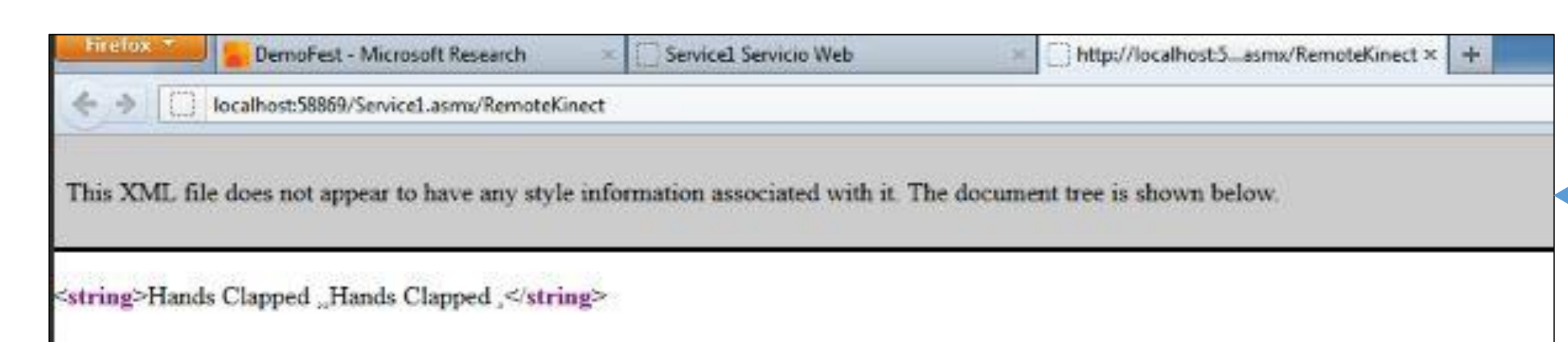
1



2

```
private void PatchHandClappingGesture(Skeleton skeleton)
{
    if (skeleton == null)
    {
        return;
    }
    if (skeleton.Joints[JointType.HandRight].TrackingState == JointTrackingState.Tracked && skeleton.Joints[JointType.HandLeft].TrackingState == JointTrackingState.Tracked)
    {
        float currentDistanceClap = GetDistance(skeleton.Joints[JointType.HandRight], skeleton.Joints[JointType.HandLeft]);
        if (currentDistanceClap < 0.1f && previousDistanceClap > 0.1f)
        {
            if (this.GestureRecognized != null)
            {
                this.GestureRecognized(this, new GestureEventArgs(RecognitionResult.HandClapped));
            }
            previousDistanceClap = currentDistanceClap;
        }
    }
}
```

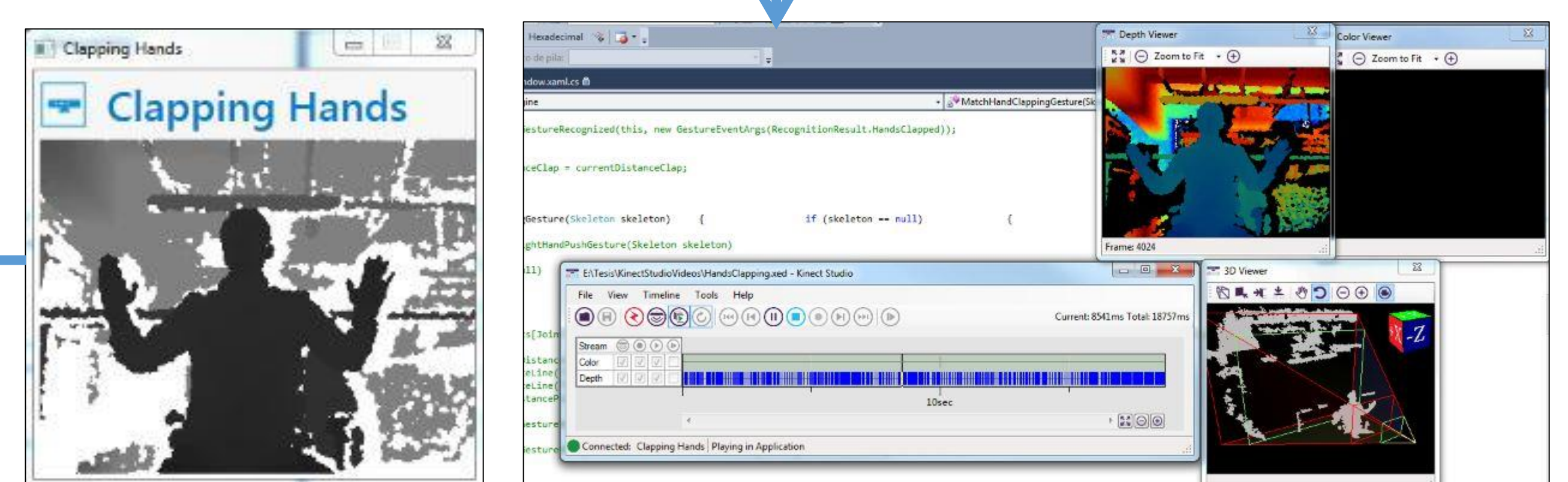
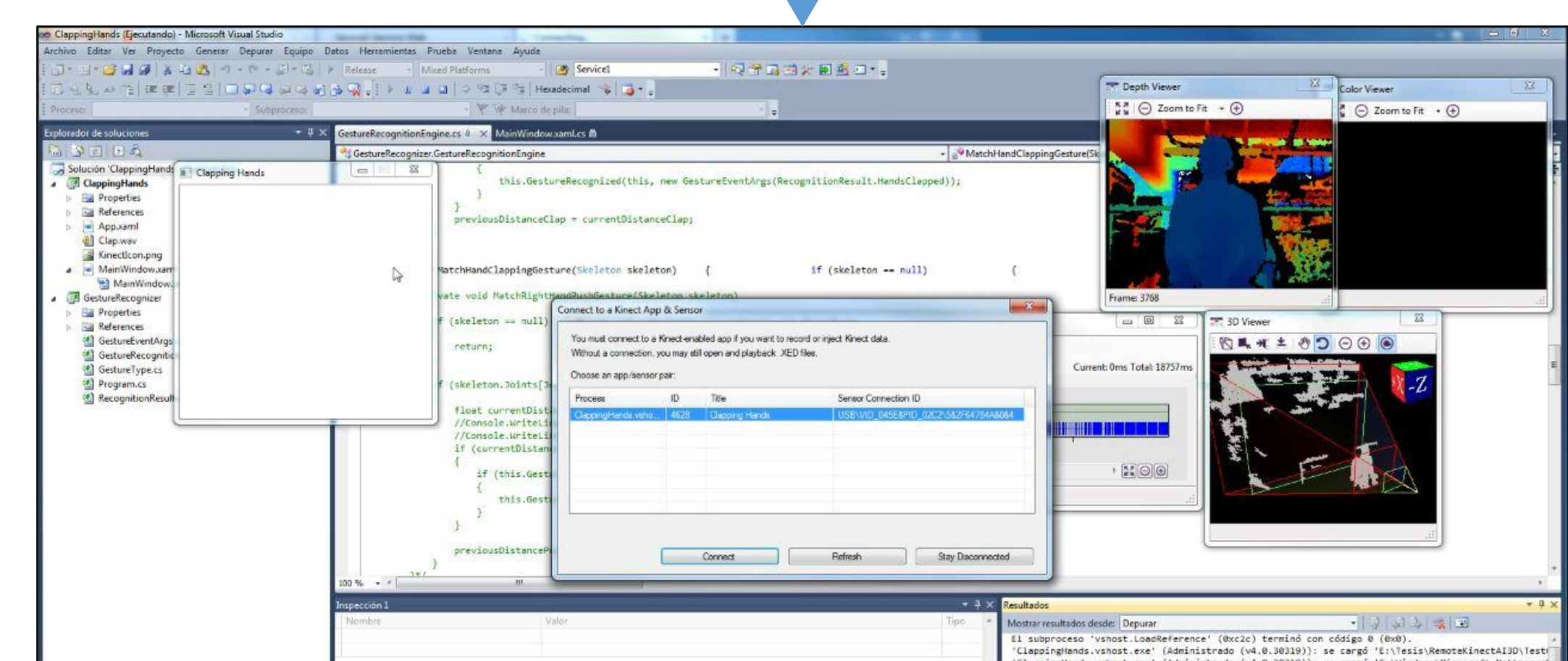
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Methodology

First the user logs into a website that contains an empty text box (1) to introduce the missing code (2) into a C# file in (3). The server receives the piece of code, and attaches it in the designated place for it. Then, if the Kinect application compiles correctly, it will open an instance of Kinect Studio and automatically loads a XED file which contains a video of a certain gesture (4). If the code inserted by the user is correct, it will identify the gesture (5) and finally return the set of gestures into an XML file that will be displayed in a web service (6).