

# splines plugin code default

```
using System;
using System.Collections.Generic;
using System.Linq;
using Unity.Collections;
using Unity.Mathematics;
using UnityEngine;
using UnityEngine.Serialization;
using UnityEngine.Splines;
using Random = UnityEngine.Random;

#if UNITY_EDITOR
using UnityEditor;
#endif

namespace UnityEngine.Splines
{
    /// <summary>
    /// SplineInstantiate is used to automatically instantiate prefabs or objects along a
    spline.
    /// </summary>
    [ExecuteInEditMode]
    [AddComponentMenu("Splines/Spline Instantiate")]
    public class SplineInstantiate : SplineComponent
    {
        /// <summary>
        /// The space in which to interpret the offset, this can be different from the
        orientation space used to instantiate objects.
        /// </summary>
        public enum OffsetSpace
        {
            /// <summary> Use the spline space to orient instances.</summary>
            [InspectorName("Spline Element")]
            Spline = Space.Spline,
            /// <summary> Use the spline GameObject space to orient instances.</summary>
            [InspectorName("Spline Object")]
        }
    }
}
```

```

    Local = Space.Local,
    /// <summary> Use world space to orient instances.</summary>
    [InspectorName("World Space")]
    World = Space.World,
    /// <summary> Use the original object space to orient instances.</summary>
    [InspectorName("Instantiated Object")]
    Object
}

```

[Serializable]

```
internal struct Vector3Offset
```

```
{
```

```
    [Flags]
```

```
    public enum Setup
```

```
    {
```

```
        None = 0x0,
```

```
        HasOffset = 0x1,
```

```
        HasCustomSpace = 0x2
```

```
    }
```

```
    public Setup setup;
```

```
    public Vector3 min;
```

```
    public Vector3 max;
```

```
    public bool randomX;
```

```
    public bool randomY;
```

```
    public bool randomZ;
```

```
    public OffsetSpace space;
```

```
    public bool hasOffset => (setup & Setup.HasOffset) != 0;
```

```
    public bool hasCustomSpace => (setup & Setup.HasCustomSpace) != 0;
```

```
    internal Vector3 GetNextOffset()
```

```
    {
```

```
        if ((setup & Setup.HasOffset) != 0)
```

```
        {
```

```
            return new Vector3(
```

```
                randomX ? Random.Range(min.x, max.x) : min.x,
```

```
                randomY ? Random.Range(min.y, max.y) : min.y,
```

```

        randomZ ? Random.Range(min.z, max.z) : min.z);
    }

    return Vector3.zero;
}

internal void CheckMinMaxValidity()
{
    max.x = Mathf.Max(min.x, max.x);
    max.y = Mathf.Max(min.y, max.y);
    max.z = Mathf.Max(min.z, max.z);
}

internal void CheckMinMax()
{
    CheckMinMaxValidity();
    if (max.magnitude > 0)
        setup |= Setup.HasOffset;
    else
        setup &= ~Setup.HasOffset;
}

internal void CheckCustomSpace(Space instanceSpace)
{
    if ((int)space == (int)instanceSpace)
        setup &= ~Setup.HasCustomSpace;
    else
        setup |= Setup.HasCustomSpace;
}
}

/// <summary>
/// Describe the item prefab to instantiate and associate it with a probability
/// </summary>
[Serializable]
public struct InstantiableItem
{
    /// <summary> The prefab to instantiate.</summary>
    [HideInInspector]
    [Obsolete("Use Prefab instead.", false)]

```

```

public GameObject prefab;
/// <summary> The prefab to instantiate.</summary>
[FormerlySerializedAs("prefab")]
public GameObject Prefab;
/// <summary> Probability for this prefab. </summary>
[HideInInspector]
[Obsolete("Use Probability instead.", false)]
public float probability;
/// <summary> Probability for this prefab. </summary>
[FormerlySerializedAs("probability")]
public float Probability;
}

/// <summary>
/// Describe the possible methods to instantiate instances along the spline.
/// </summary>
public enum Method
{
    /// <summary> Use exact number of instances.</summary>
    [InspectorName("Instance Count")]
    InstanceCount,
    /// <summary> Use distance along the spline between 2 instances.</summary>
    [InspectorName("Spline Distance")]
    SpacingDistance,
    /// <summary> Use distance in straight line between 2 instances.</summary>
    [InspectorName("Linear Distance")]
    LinearDistance
}

/// <summary>
/// Describes the coordinate space that is used to orient the instantiated object.
/// </summary>
public enum Space
{
    /// <summary> Use the spline space to orient instances.</summary>
    [InspectorName("Spline Element")]
    Spline,
    /// <summary> Use the spline GameObject space to orient instances.</summary>
    [InspectorName("Spline Object")]
    Local,

```

```

    /// <summary> Use world space to orient instances.</summary>
    [InspectorName("World Space")]
    World,
}

[SerializeField]
SplineContainer m_Container;

/// <summary>
/// The SplineContainer containing the targeted spline.
/// </summary>
[Obsolete("Use Container instead.", false)]
public SplineContainer container => Container;

/// <summary>
/// The SplineContainer containing the targeted spline.
/// </summary>
public SplineContainer Container
{
    get => m_Container;
    set => m_Container = value;
}

[SerializeField]
List<InstantiableItem> m_ItemsToInstantiate = new List<InstantiableItem>();

/// <summary>
/// The items to use in the instantiation.
/// </summary>
public InstantiableItem[] itemsToInstantiate
{
    get => m_ItemsToInstantiate.ToArray();
    set
    {
        m_ItemsToInstantiate.Clear();
        m_ItemsToInstantiate.AddRange(value);
    }
}

[SerializeField]
Method m_Method = Method.SpacingDistance;

```

```

/// <summary>
/// The instantiation method to use.
/// </summary>
[Obsolete("Use InstantiateMethod instead.", false)]
public Method method => InstantiateMethod;
/// <summary>
/// The instantiation method to use.
/// </summary>
public Method InstantiateMethod
{
    get => m_Method;
    set => m_Method = value;
}

[SerializeField]
Space m_Space = Space.Spline;

/// <summary>
/// The coordinate space in which to orient the instanced object.
/// </summary>
[Obsolete("Use CoordinateSpace instead.", false)]
public Space space => CoordinateSpace;
/// <summary>
/// The coordinate space in which to orient the instanced object.
/// </summary>
public Space CoordinateSpace
{
    get => m_Space;
    set => m_Space = value;
}

[SerializeField]
Vector2 m_Spacing = new Vector2(1f, 1f);

/// <summary>
/// Minimum spacing between 2 generated instances,
/// if equal to the maxSpacing, then all instances will have the exact same spacing.
/// </summary>
public float MinSpacing

```

```

{
    get => m_Spacing.x;
    set
    {
        m_Spacing = new Vector2(value, m_Spacing.y);
        ValidateSpacing();
    }
}

/// <summary>
/// Maximum spacing between 2 generated instances,
/// if equal to the minSpacing, then all instances will have the exact same spacing
/// </summary>
public float MaxSpacing
{
    get => m_Spacing.y;
    set
    {
        m_Spacing = new Vector2(m_Spacing.x, value);
        ValidateSpacing();
    }
}

[SerializeField]
AlignAxis m_Up = AlignAxis.YAxis;

/// <summary>
/// Up axis of the object, by default set to the y-axis.
/// </summary>
[Obsolete("Use UpAxis instead.", false)]
public AlignAxis upAxis => UpAxis;
/// <summary>
/// Up axis of the object, by default set to the y-axis.
/// </summary>
public AlignAxis UpAxis
{
    get => m_Up;
    set => m_Up = value;
}

```

```

[SerializeField]
AlignAxis m_Forward = AlignAxis.ZAxis;

/// <summary>
/// Forward axis of the object, by default set to the Z Axis
/// </summary>
[Obsolete("Use ForwardAxis instead.", false)]
public AlignAxis forwardAxis => ForwardAxis;
/// <summary>
/// Forward axis of the object, by default set to the Z Axis
/// </summary>
public AlignAxis ForwardAxis
{
    get => m_Forward;
    set
    {
        m_Forward = value;
        ValidateAxis();
    }
}

[SerializeField]
Vector3offset m_PositionOffset;

/// <summary>
/// Minimum (X,Y,Z) position offset to randomize instanced objects positions.
/// (X,Y and Z) values have to be lower to the ones of maxPositionOffset.
/// </summary>
[Obsolete("Use MinPositionOffset instead.", false)]
public Vector3 minPositionOffset => MinPositionOffset;
/// <summary>
/// Minimum (X,Y,Z) position offset to randomize instanced objects positions.
/// (X,Y and Z) values have to be lower to the ones of maxPositionOffset.
/// </summary>
public Vector3 MinPositionOffset
{
    get => m_PositionOffset.min;
    set
    {
        m_PositionOffset.min = value;
    }
}

```

```

        m_PositionOffset.CheckMinMax();
    }
}

/// <summary>
/// Maximum (X,Y,Z) position offset to randomize instanced objects positions.
/// (X,Y and Z) values have to be higher to the ones of minPositionOffset.
/// </summary>
[Obsolete("Use MaxPositionOffset instead.", false)]
public Vector3 maxPositionOffset => MaxPositionOffset;
/// <summary>
/// Maximum (X,Y,Z) position offset to randomize instanced objects positions.
/// (X,Y and Z) values have to be higher to the ones of minPositionOffset.
/// </summary>
public Vector3 MaxPositionOffset
{
    get => m_PositionOffset.max;
    set
    {
        m_PositionOffset.max = value;
        m_PositionOffset.CheckMinMax();
    }
}

/// <summary>
/// Coordinate space to use to offset positions of the instances.
/// </summary>
[Obsolete("Use PositionSpace instead.", false)]
public OffsetSpace positionSpace => PositionSpace;
/// <summary>
/// Coordinate space to use to offset positions of the instances.
/// </summary>
public OffsetSpace PositionSpace
{
    get => m_PositionOffset.space;
    set
    {
        m_PositionOffset.space = value;
        m_PositionOffset.CheckCustomSpace(m_Space);
    }
}

```

```

}

[SerializeField]
Vector3offset m_RotationOffset;

/// <summary>
/// Minimum (X,Y,Z) euler rotation offset to randomize instanced objects rotations.
/// (X,Y and Z) values have to be lower to the ones of maxRotationOffset.
/// </summary>
[Obsolete("Use MinRotationOffset instead.", false)]
public Vector3 minRotationOffset => MinRotationOffset;
/// <summary>
/// Minimum (X,Y,Z) euler rotation offset to randomize instanced objects rotations.
/// (X,Y and Z) values have to be lower to the ones of maxRotationOffset.
/// </summary>
public Vector3 MinRotationOffset
{
    get => m_RotationOffset.min;
    set
    {
        m_RotationOffset.min = value;
        m_RotationOffset.CheckMinMax();
    }
}

/// <summary>
/// Maximum (X,Y,Z) euler rotation offset to randomize instanced objects rotations.
/// (X,Y and Z) values have to be higher to the ones of minRotationOffset.
/// </summary>
[Obsolete("Use MaxRotationOffset instead.", false)]
public Vector3 maxRotationOffset => MaxRotationOffset;
/// <summary>
/// Maximum (X,Y,Z) euler rotation offset to randomize instanced objects rotations.
/// (X,Y and Z) values have to be higher to the ones of minRotationOffset.
/// </summary>
public Vector3 MaxRotationOffset
{
    get => m_RotationOffset.max;
    set
    {

```

```

        m_RotationOffset.max = value;
        m_RotationOffset.CheckMinMax();
    }
}

/// <summary>
/// Coordinate space to use to offset rotations of the instances.
/// </summary>
[Obsolete("Use RotationSpace instead.", false)]
public OffsetSpace rotationSpace => RotationSpace;
/// <summary>
/// Coordinate space to use to offset rotations of the instances.
/// </summary>
public OffsetSpace RotationSpace
{
    get => m_RotationOffset.space;
    set
    {
        m_RotationOffset.space = value;
        m_RotationOffset.CheckCustomSpace(m_Space);
    }
}

[SerializeField]
Vector3offset m_ScaleOffset;

/// <summary>
/// Minimum (X,Y,Z) scale offset to randomize instanced objects scales.
/// (X,Y and Z) values have to be lower to the ones of maxScaleOffset.
/// </summary>
[Obsolete("Use MinScaleOffset instead.", false)]
public Vector3 minScaleOffset => MinScaleOffset;
/// <summary>
/// Minimum (X,Y,Z) scale offset to randomize instanced objects scales.
/// (X,Y and Z) values have to be lower to the ones of maxScaleOffset.
/// </summary>
public Vector3 MinScaleOffset
{
    get => m_ScaleOffset.min;
    set

```

```

        {
            m_ScaleOffset.min = value;
            m_ScaleOffset.CheckMinMax();
        }
    }

    /// <summary>
    /// Maximum (X,Y,Z) scale offset to randomize instanced objects scales.
    /// (X,Y and Z) values have to be higher to the ones of minScaleOffset.
    /// </summary>
    [Obsolete("Use MaxScaleOffset instead.", false)]
    public Vector3 maxScaleOffset => MaxScaleOffset;
    /// <summary>
    /// Maximum (X,Y,Z) scale offset to randomize instanced objects scales.
    /// (X,Y and Z) values have to be higher to the ones of minScaleOffset.
    /// </summary>
    public Vector3 MaxScaleOffset
    {
        get => m_ScaleOffset.max;
        set
        {
            m_ScaleOffset.max = value;
            m_ScaleOffset.CheckMinMax();
        }
    }

    /// <summary>
    /// Coordinate space to use to offset rotations of the instances (usually
OffsetSpace.Object).
    /// </summary>
    [Obsolete("Use ScaleSpace instead.", false)]
    public OffsetSpace scaleSpace => ScaleSpace;
    /// <summary>
    /// Coordinate space to use to offset rotations of the instances (usually
OffsetSpace.Object).
    /// </summary>
    public OffsetSpace ScaleSpace
    {
        get => m_ScaleOffset.space;
        set

```

```

    {
        m_ScaleOffset.space = value;
        m_ScaleOffset.CheckCustomSpace(m_Space);
    }
}

```

// Keep old serialization of instances to ensure that no zombie instances will remain serialized.

```

[SerializeField, HideInInspector, FormerlySerializedAs("m_Instances")]
List<GameObject> m_DeprecatedInstances = new List<GameObject>();

```

```

const string k_InstancesRootName = "root-";
GameObject m_InstancesRoot;

```

Transform instancesRootTransform

```

{
    get
    {
        if (m_InstancesRoot == null)
        {
            m_InstancesRoot = new GameObject(k_InstancesRootName+GetInstanceID());
            m_InstancesRoot.hideFlags |= HideFlags.HideAndDontSave;
            m_InstancesRoot.transform.parent = transform;
            m_InstancesRoot.transform.localPosition = Vector3.zero;
            m_InstancesRoot.transform.localRotation = Quaternion.identity;
        }
        return m_InstancesRoot.transform;
    }
}

```

```

readonly List<GameObject> m_Instances = new List<GameObject>();
internal List<GameObject> instances => m_Instances;
bool m_InstancesCacheDirty = false;

```

```

[SerializeField]
bool m_AutoRefresh = true;

```

```

InstantiableItem m_CurrentItem;

```

```

bool m_SplineDirty = false;
float m_MaxProbability = 1f;

```

```

float maxProbability
{
    get => m_MaxProbability;
    set
    {
        if (m_MaxProbability != value)
        {
            m_MaxProbability = value;
            m_InstancesCacheDirty = true;
        }
    }
}

[HideInInspector]
[SerializeField]
int m_Seed = 0;

int seed
{
    get => m_Seed;
    set
    {
        m_Seed = value;
        m_InstancesCacheDirty = true;
        Random.InitState(m_Seed);
    }
}

List<float> m_TimesCache = new();
List<float> m_LengthsCache = new();

void OnEnable()
{
    if (m_Seed == 0)
        m_Seed = GetInstanceID();
}

#ifdef UNITY_EDITOR
    Undo.undoRedoPerformed += UndoRedoPerformed;
#endif

```

```

//Bugfix for SPLB-107: Duplicating a SplineInstantiate is making children visible
//This ensure to delete the invalid children.
CheckChildrenValidity();

Spline.Changed += OnSplineChanged;
UpdateInstances();
}

void OnDisable()
{
#if UNITY_EDITOR
    Undo.undoRedoPerformed -= UndoRedoPerformed;
#endif

    Spline.Changed -= OnSplineChanged;
    Clear();
}

void UndoRedoPerformed()
{
    m_InstancesCacheDirty = true;
    m_SplineDirty = true;
}

void OnValidate()
{
    ValidateSpacing();

    m_SplineDirty = m_AutoRefresh;

    EnsureItemsValidity();

    m_PositionOffset.CheckMinMaxValidity();
    m_RotationOffset.CheckMinMaxValidity();
    m_ScaleOffset.CheckMinMaxValidity();
}

void EnsureItemsValidity()
{
    float probability = 0;

```

```

for (int i = 0; i < m_ItemsToInstantiate.Count; i++)
{
    var item = m_ItemsToInstantiate[i];

    if (item.Prefab != null)
    {
        if (transform.IsChildOf(item.Prefab.transform))
        {
            Debug.LogWarning("Instantiating a parent of the SplineInstantiate
object itself is not permitted" +
                $" ({item.Prefab.name} is a parent of
{transform.gameObject.name}).");
            item.Prefab = null;
            m_ItemsToInstantiate[i] = item;
        }
        else
            probability += item.Probability;
    }
}
maxProbability = probability;
}

void CheckChildrenValidity()
{
    // All the children have to be checked in case multiple SplineInstantiate
components are used on the same GameObject.
    // We want to be able to have multiple components as it allows for example to
instantiate grass and
    // trees with different parameters on the same object.
    var ids = GetComponents<SplineInstantiate>().Select(sInstantiate =>
sInstantiate.GetInstanceID()).ToList();
    var childCount = transform.childCount;
    for (int i = childCount - 1; i >= 0; --i)
    {
        var child = transform.GetChild(i).gameObject;
        if (child.name.StartsWith(k_InstancesRootName))
        {
            var invalid = true;
            foreach (var instanceID in ids)
            {

```

```

        if (child.name.Equals(k_InstancesRootName + instanceID))
        {
            invalid = false;
            break;
        }
    }

    if (invalid)
#if UNITY_EDITOR
        DestroyImmediate(child);
#else
        Destroy(child);
#endif
    }
}

void ValidateSpacing()
{
    var xSpacing = Mathf.Max(0.1f, m_Spacing.x);
    if (m_Method != Method.LinearDistance)
    {
        var ySpacing = float.IsNaN(m_Spacing.y) ? xSpacing : Mathf.Max(0.1f,
m_Spacing.y);
        m_Spacing = new Vector2(xSpacing, Mathf.Max(xSpacing, ySpacing));
    }
    else if (m_Method == Method.LinearDistance)
    {
        var ySpacing = float.IsNaN(m_Spacing.y) ? m_Spacing.y : xSpacing;
        m_Spacing = new Vector2(xSpacing, ySpacing);
    }
}

/// <summary>
/// This method prevents Up and Forward axis to be aligned.
/// Up axis will always be kept as the prioritized one.
/// If Forward axis is in the same direction than the Up (or -Up) it'll be changed to
the next axis.
/// </summary>
void ValidateAxis()

```

```

{
    if (m_Forward == m_Up || (int)m_Forward == ((int)m_Up + 3) % 6)
        m_Forward = (AlignAxis)(((int)m_Forward + 1) % 6);
}

internal void SetSplineDirty(Spline spline)
{
    if (m_Container != null && m_Container.Splines.Contains(spline) && m_AutoRefresh)
        UpdateInstances();
}

void InitContainer()
{
    if (m_Container == null)
        m_Container = GetComponent<SplineContainer>();
}

/// <summary>
/// Clear all the created instances along the spline
/// </summary>
public void Clear()
{
    SetDirty();
    TryClearCache();
}

/// <summary>
/// Set the created instances dirty to erase them next time instances will be
generated
/// (otherwise the next generation will reuse cached instances)
/// </summary>
public void SetDirty()
{
    m_InstancesCacheDirty = true;
}

void TryClearCache()
{
    if (!m_InstancesCacheDirty)
    {

```

```

        for (int i = 0; i < m_Instances.Count; i++)
        {
            if (m_Instances[i] == null)
            {
                m_InstancesCacheDirty = true;
                break;
            }
        }

        if (m_InstancesCacheDirty)
        {
            for (int i = m_Instances.Count - 1; i >= 0; --i)
            {
#if UNITY_EDITOR
                DestroyImmediate(m_Instances[i]);
#else
                Destroy(m_Instances[i]);
#endif
            }

#if UNITY_EDITOR
            DestroyImmediate(m_InstancesRoot);
#else
            Destroy(m_InstancesRoot);
#endif

            m_Instances.Clear();
            m_InstancesCacheDirty = false;
        }
    }

    void ClearDeprecatedInstances()
    {
        foreach (var instance in m_DeprecatedInstances)
        {
#if UNITY_EDITOR
            DestroyImmediate(instance);
#else
            Destroy(instance);
#endif
        }
    }
}

```

```

    }

    m_DeprecatedInstances.Clear();
}

/// <summary>
/// Change the Random seed to obtain a new generation along the Spline
/// </summary>
public void Randomize()
{
    seed = Random.Range(int.MinValue, int.MaxValue);
    m_SplineDirty = true;
}

void Update()
{
    if (m_SplineDirty)
        UpdateInstances();
}

/// <summary>
/// Create and update all instances along the spline based on the list of available
prefabs/objects.
/// </summary>
public void UpdateInstances()
{
    ClearDeprecatedInstances();
    TryClearCache();

    if (m_Container == null)
        InitContainer();

    if (m_Container == null || m_ItemsToInstantiate.Count == 0)
        return;

    const float k_Epsilon = 0.001f;
    Random.InitState(m_Seed);
    int index = 0;
    int indexOffset = 0;

```

```

m_LengthsCache.Clear();
var splineLength = 0f;
var totalSplineLength = 0f;
for (int splineIndex = 0; splineIndex < m_Container.Splines.Count; splineIndex++)
{
    var length = m_Container.CalculateLength(splineIndex);
    m_LengthsCache.Add(length);
    totalSplineLength += length;
}

var spacing = Random.Range(m_Spacing.x, m_Spacing.y);
var currentDist = 0f;
var instanceCountModeStep = 0f;

if (m_Method == Method.InstanceCount)
{
    // Advance dist by half length if we only need to spawn one item - we want to
spawn it mid total spline length
    if (spacing == 1)
        currentDist = totalSplineLength / 2f;
    else if (spacing < 1) // Using less operator here as the spacing setters
always clamp spacing to a minimum value of 0.1
    {
        // If there's nothing to spawn, make currentDist larger than length to
effectively skip prefab spawning but still trigger previous spawn cleanup
        currentDist = totalSplineLength + 1f;
    }

    // Take into account the Closed property only if there's one spline in
container
    if (m_Container.Splines.Count == 1)
        instanceCountModeStep = totalSplineLength / (m_Container.Splines[0].Closed
? (int)spacing : (int)spacing - 1);
    else
        instanceCountModeStep = totalSplineLength / ((int)spacing - 1);
}

//Needs to ensure the validity of the items to instantiate to be certain we don't
have a parent of the hierarchy in these.
EnsureItemsValidity();

```

```

for (int splineIndex = 0; splineIndex < m_Container.Splines.Count; splineIndex++)
{
    var spline = m_Container.Splines[splineIndex];
    using (var nativeSpline = new NativeSpline(spline,
m_Container.transform.localToWorldMatrix, Allocator.TempJob))
    {
        splineLength = m_LengthsCache[splineIndex];
        var terminateSpawning = false;

        if (m_Method == Method.InstanceCount)
        {
            if (currentDist > (splineLength + k_Epsilon) && currentDist <=
(totalSplineLength + k_Epsilon))
            {
                currentDist -= splineLength;
                terminateSpawning = true;
            }
        }
        else
            currentDist = 0f;

        m_TimesCache.Clear();

        while (currentDist <= (splineLength + k_Epsilon) && !terminateSpawning)
        {
            if (!SpawnPrefab(index))
                break;

            m_TimesCache.Add(currentDist / splineLength);

            if (m_Method == Method.SpacingDistance)
            {
                spacing = Random.Range(m_Spacing.x, m_Spacing.y);
                currentDist += spacing;
            }
            else if (m_Method == Method.InstanceCount)
            {
                if (spacing > 1)
                {

```

```

        var previousDist = currentDist;

        currentDist += instanceCountModeStep;

        if (previousDist < splineLength && currentDist > (splineLength
+ k_Epsilon))
        {
            currentDist -= splineLength;
            terminateSpawning = true;
        }
    }
    // If we're here, we're spawning 1 object or none, therefore add
total length to currentDist
    // so that we no longer enter the while loop as the object has
been spawned already
    else
        currentDist += totalSplineLength;
}
else if (m_Method == Method.LinearDistance)
{
    //m_Spacing.y is set to NaN to trigger automatic computation
    if (float.IsNaN(m_Spacing.y))
    {
        var meshfilter =
m_Instances[index].GetComponent<MeshFilter>();
        var axis = Vector3.right;
        if (m_Forward == AlignAxis.ZAxis || m_Forward ==
AlignAxis.NegativeZAxis)
            axis = Vector3.forward;
        if (m_Forward == AlignAxis.YAxis || m_Forward ==
AlignAxis.NegativeYAxis)
            axis = Vector3.up;

        if (meshfilter == null)
        {
            meshfilter =
m_Instances[index].GetComponentInChildren<MeshFilter>();
            if (meshfilter != null)
                axis =
Vector3.Scale(meshfilter.transform.InverseTransformDirection(m_Instances[index].transform.Tran

```

```

sformDirection(axis)), meshfilter.transform.lossyScale);
        }

        if (meshfilter != null)
        {
            var bounds = meshfilter.sharedMesh.bounds;
            var filters =
meshfilter.GetComponentInChildren<MeshFilter>();
            foreach (var filter in filters)
            {
                var localBounds = filter.sharedMesh.bounds;
                bounds.size = new Vector3(Mathf.Max(bounds.size.x,
localBounds.size.x),
                    Mathf.Max(bounds.size.z, localBounds.size.z),
                    Mathf.Max(bounds.size.z, localBounds.size.z));
            }

            spacing = Vector3.Scale(bounds.size, axis).magnitude;
        }
    }
    else
        spacing = Random.Range(m_Spacing.x, m_Spacing.y);

    nativeSpline.GetPointAtLinearDistance(m_TimesCache[index],
spacing, out var nextT);
    currentDist = nextT >= 1f ? splineLength + 1f : nextT *
splineLength;
    }

    index++;
}

//removing extra unnecessary instances
for (int i = m_Instances.Count - 1; i >= index; i--)
{
    if (m_Instances[i] != null)
    {
#if UNITY_EDITOR
        DestroyImmediate(m_Instances[i]);
#else

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        Destroy(m_Instances[i]);
#endif

        m_Instances.RemoveAt(i);
    }
}

//Positioning elements
for (int i = indexOffset; i < index; i++)
{
    var instance = m_Instances[i];
    var splineT = m_TimesCache[i - indexOffset];

    nativeSpline.Evaluate(splineT, out var position, out var direction,
out var splineUp);

    instance.transform.position = position;

    if (m_Method == Method.LinearDistance)
    {
        var nextPosition = nativeSpline.EvaluatePosition(i + 1 < index ?
m_TimesCache[i + 1 - indexOffset] : 1f);
        direction = nextPosition - position;
    }

    var up = math.normalizesafe(splineUp);
    var forward = math.normalizesafe(direction);
    if (m_Space == Space.World)
    {
        up = Vector3.up;
        forward = Vector3.forward;
    }
    else if (m_Space == Space.Local)
    {
        up = transform.TransformDirection(Vector3.up);
        forward = transform.TransformDirection(Vector3.forward);
    }

    // Correct forward and up vectors based on axis remapping parameters
    var remappedForward = math.normalizesafe(GetAxis(m_Forward));
    var remappedUp = math.normalizesafe(GetAxis(m_Up));
    var axisRemapRotation =

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Quaternion.Inverse(Quaternion.LookRotation(remappedForward, remappedUp));

        instance.transform.rotation = Quaternion.LookRotation(forward, up) *
axisRemapRotation;

        var customUp = up;
        var customForward = forward;
        if (m_PositionOffset.hasOffset)
        {
            if (m_PositionOffset.hasCustomSpace)
                GetCustomSpaceAxis(m_PositionOffset.space, splineUp,
direction, instance.transform, out customUp, out customForward);

            var offset = m_PositionOffset.GetNextOffset();
            var right = Vector3.Cross(customUp, customForward).normalized;
            instance.transform.position += offset.x * right + offset.y *
(Vector3)customUp + offset.z * (Vector3)customForward;
        }

        if (m_ScaleOffset.hasOffset)
        {
            customUp = up;
            customForward = forward;
            if (m_ScaleOffset.hasCustomSpace)
                GetCustomSpaceAxis(m_ScaleOffset.space, splineUp, direction,
instance.transform, out customUp, out customForward);

            customUp =
instance.transform.InverseTransformDirection(customUp).normalized;
            customForward =
instance.transform.InverseTransformDirection(customForward).normalized;

            var offset = m_ScaleOffset.GetNextOffset();
            var right = Vector3.Cross(customUp, customForward).normalized;
            instance.transform.localScale += offset.x * right + offset.y *
(Vector3)customUp + offset.z * (Vector3)customForward;
        }

        if (m_RotationOffset.hasOffset)
        {

```

```

        customUp = up;
        customForward = forward;
        if (m_RotationOffset.hasCustomSpace)
        {
            GetCustomSpaceAxis(m_RotationOffset.space, splineUp,
direction, instance.transform, out customUp, out customForward);
            if (m_RotationOffset.space == OffsetSpace.Object)
                axisRemapRotation = quaternion.identity;
        }

        var offset = m_RotationOffset.GetNextOffset();

        var right = Vector3.Cross(customUp, customForward).normalized;
        customForward = Quaternion.AngleAxis(offset.y, customUp) *
Quaternion.AngleAxis(offset.x, right) * customForward;
        customUp = Quaternion.AngleAxis(offset.x, right) *
Quaternion.AngleAxis(offset.z, customForward) * customUp;
        instance.transform.rotation =
Quaternion.LookRotation(customForward, customUp) * axisRemapRotation;
    }
}

    indexOffset = index;
}
}

    m_SplineDirty = false;
}

bool SpawnPrefab(int index)
{
    var prefabIndex = m_ItemsToInstantiate.Count == 1 ? 0 : GetPrefabIndex();
    m_CurrentItem = m_ItemsToInstantiate[prefabIndex];

    if (m_CurrentItem.Prefab == null)
        return false;

    if (index >= m_Instances.Count)
    {
#if UNITY_EDITOR

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        var assetType = PrefabUtility.GetPrefabAssetType(m_CurrentItem.Prefab);
        if (assetType == PrefabAssetType.MissingAsset)
        {
            Debug.LogError($"Trying to instantiate a missing asset for item index
[{prefabIndex}].");
            return false;
        }

        if (assetType != PrefabAssetType.NotAPrefab && !Application.isPlaying)
            m_Instances.Add(PrefabUtility.InstantiatePrefab(m_CurrentItem.Prefab,
instancesRootTransform) as GameObject);
        else
#endif
            m_Instances.Add(Instantiate(m_CurrentItem.Prefab,
instancesRootTransform));

        m_Instances[index].hideFlags |= HideFlags.HideAndDontSave;
    }

    m_Instances[index].transform.localPosition =
m_CurrentItem.Prefab.transform.localPosition;
    m_Instances[index].transform.localRotation =
m_CurrentItem.Prefab.transform.localRotation;
    m_Instances[index].transform.localScale =
m_CurrentItem.Prefab.transform.localScale;

    return true;
}

void GetCustomSpaceAxis(OffsetSpace space, float3 splineUp, float3 direction,
Transform instanceTransform, out float3 customUp, out float3 customForward)
{
    customUp = Vector3.up;
    customForward = Vector3.forward;
    if (space == OffsetSpace.Local)
    {
        customUp = transform.TransformDirection(Vector3.up);
        customForward = transform.TransformDirection(Vector3.forward);
    }
    else if (space == OffsetSpace.Spline)

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    {
        customUp = splineUp;
        customForward = direction;
    }
    else if (space == OffsetSpace.Object)
    {
        customUp = instanceTransform.TransformDirection(Vector3.up);
        customForward = instanceTransform.TransformDirection(Vector3.forward);
    }
}

int GetPrefabIndex()
{
    var prefabChoice = Random.Range(0, m_MaxProbability);
    var currentProbability = 0f;
    for (int i = 0; i < m_ItemsToInstantiate.Count; i++)
    {
        if (m_ItemsToInstantiate[i].Prefab == null)
            continue;

        var itemProbability = m_ItemsToInstantiate[i].Probability;
        if (prefabChoice < currentProbability + itemProbability)
            return i;

        currentProbability += itemProbability;
    }

    return 0;
}

void OnSplineChanged(Spline spline, int knotIndex, SplineModification
modificationType)
{
    if (m_Container != null && m_Container.Spline == spline)
        m_SplineDirty = m_AutoRefresh;
}
}
}

```

Revision #1

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