



INDEPENDENT GAMES
SUMMIT

Perlin Noise: Animation Without Animators

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GDC

GAME DEVELOPERS CONFERENCE

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This could be difficult for you if you don't know anything at all about programming.



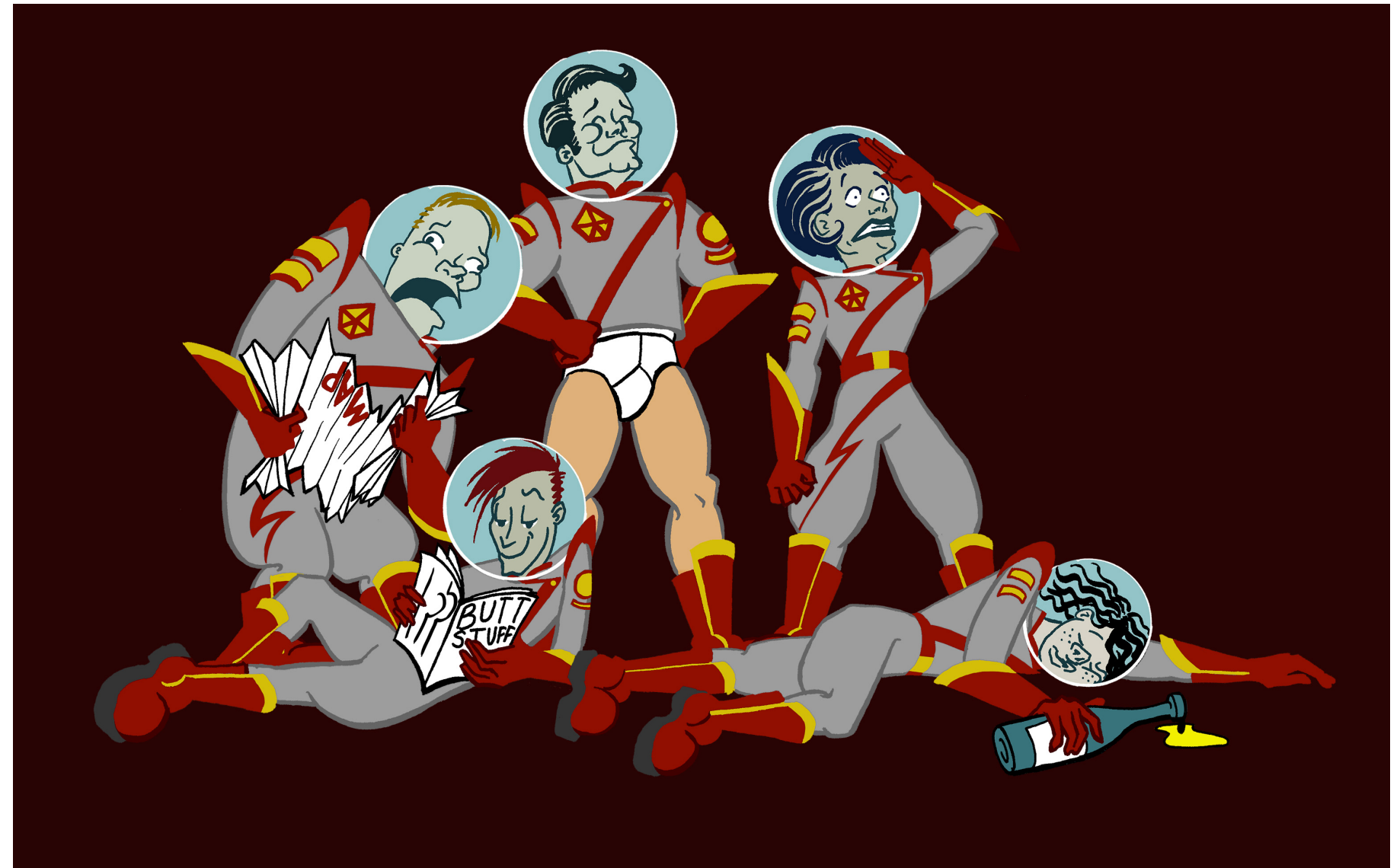
This could be too easy for you if you're already super good at computers.



Perlin Noise Animation



Small Team. No Animators.



Put a Perlin On It



Nick



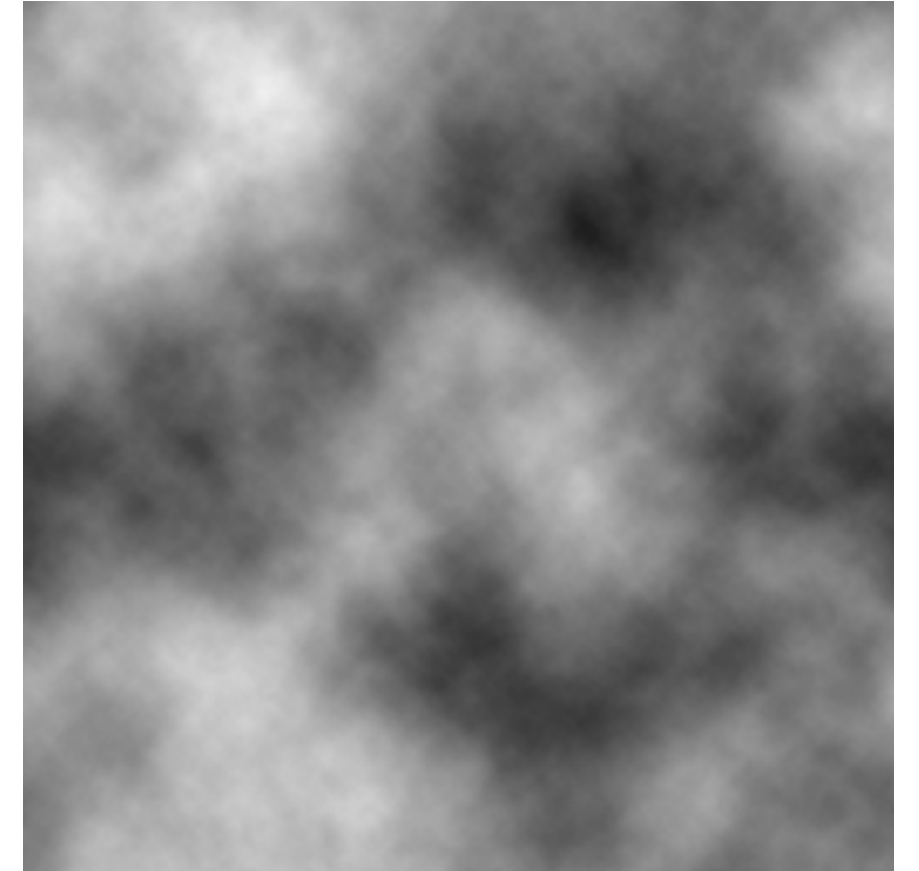
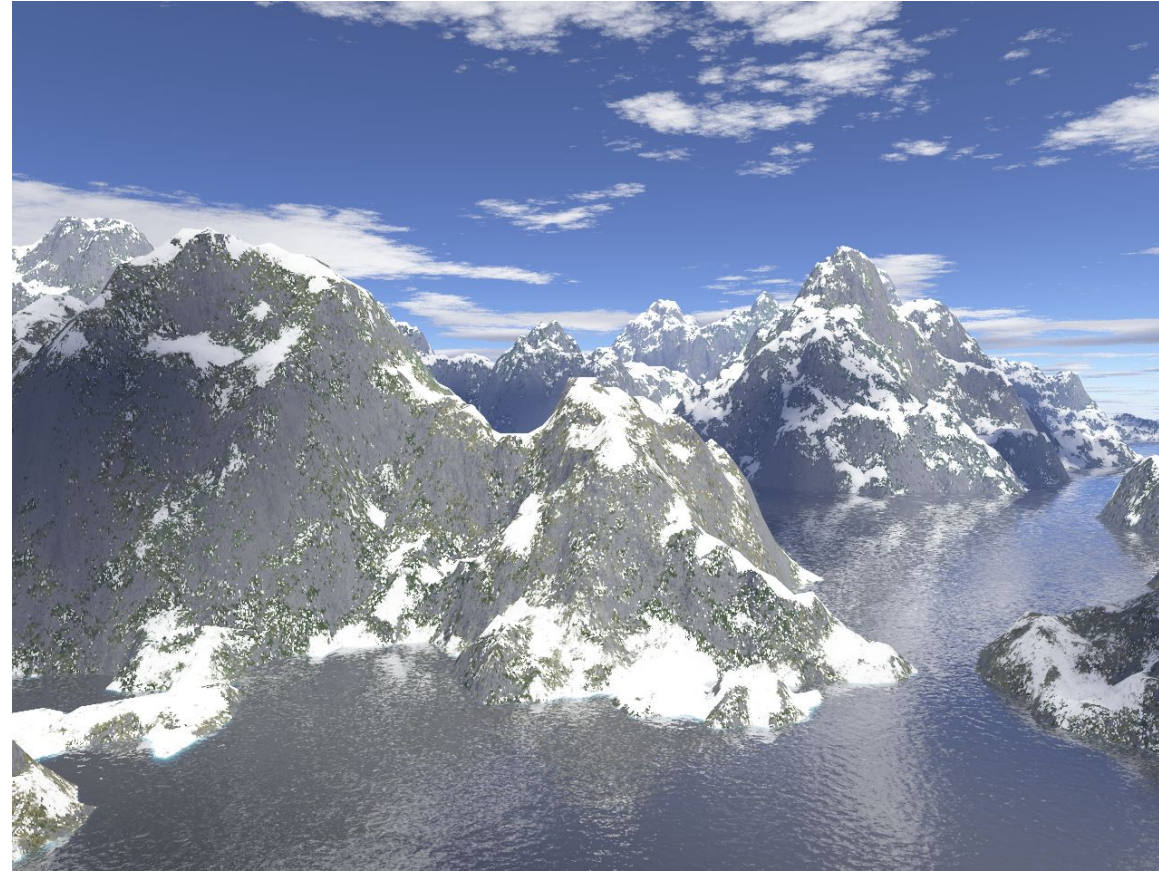


Ken Perlin

Thanks,
Ken



Bitmaps Generated by Perlin Noise



Amplitude Over Time Functions

```
public class DemoGraphFunctions : MonoBehaviour
{
    [SerializeField] float PerlinSeedValue;

    public float GetAmplitudeRandom(float timeValue)
    {
        float randomSeedTimescale = 100f;
        UnityEngine.Random.InitState(Mathf.RoundToInt(timeValue * randomSeedTimescale));
        return UnityEngine.Random.value;
    }

    public float GetAmplitudeSine(float timeValue)
    {
        float sineRaw = (float)Mathf.Sin(timeValue);
        return Mathf.InverseLerp(-1f, 1f, sineRaw);
    }

    public float GetAmplitudePerlin(float timeValue)
    {
        return Mathf.PerlinNoise(timeValue, PerlinSeedValue);
    }
}
```

Perlin Translation

```
public class DemoPerlinTranslate : MonoBehaviour
{
    [SerializeField] float XPosMin;
    [SerializeField] float XPosMax;
    [SerializeField] float TimeScale;
    [SerializeField] float SeedValue;

    void Start()
    {
        StartCoroutine(ModulateXPosition());
    }

    IEnumerator ModulateXPosition()
    {
        Vector3 basePosition = transform.localPosition;

        while(true)
        {
            float amplitudeNormalized = Mathf.PerlinNoise(Time.time * TimeScale, SeedValue);
            float xPos = Mathf.Lerp(XPosMin, XPosMax, amplitudeNormalized);
            transform.localPosition = basePosition + new Vector3(xPos, 0f, 0f);
            yield return null;
        }
    }
}
```


Perlin Rotation

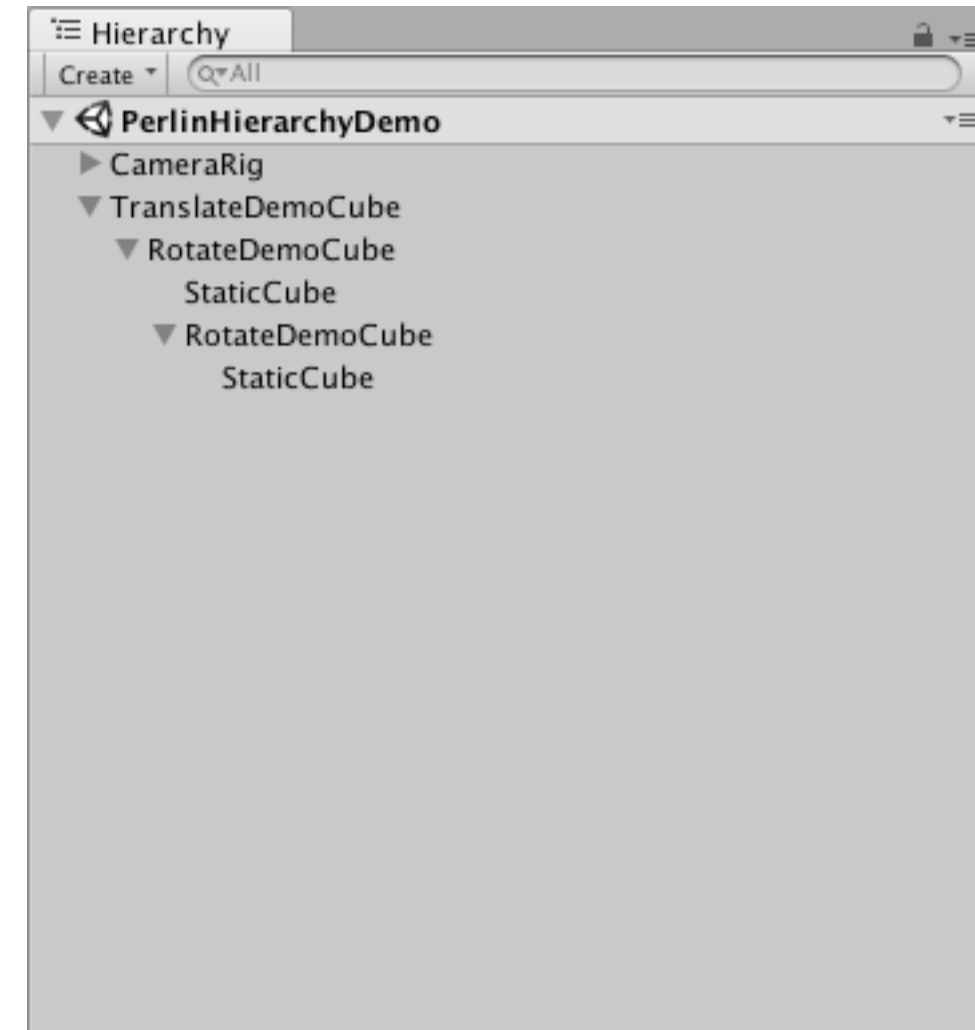
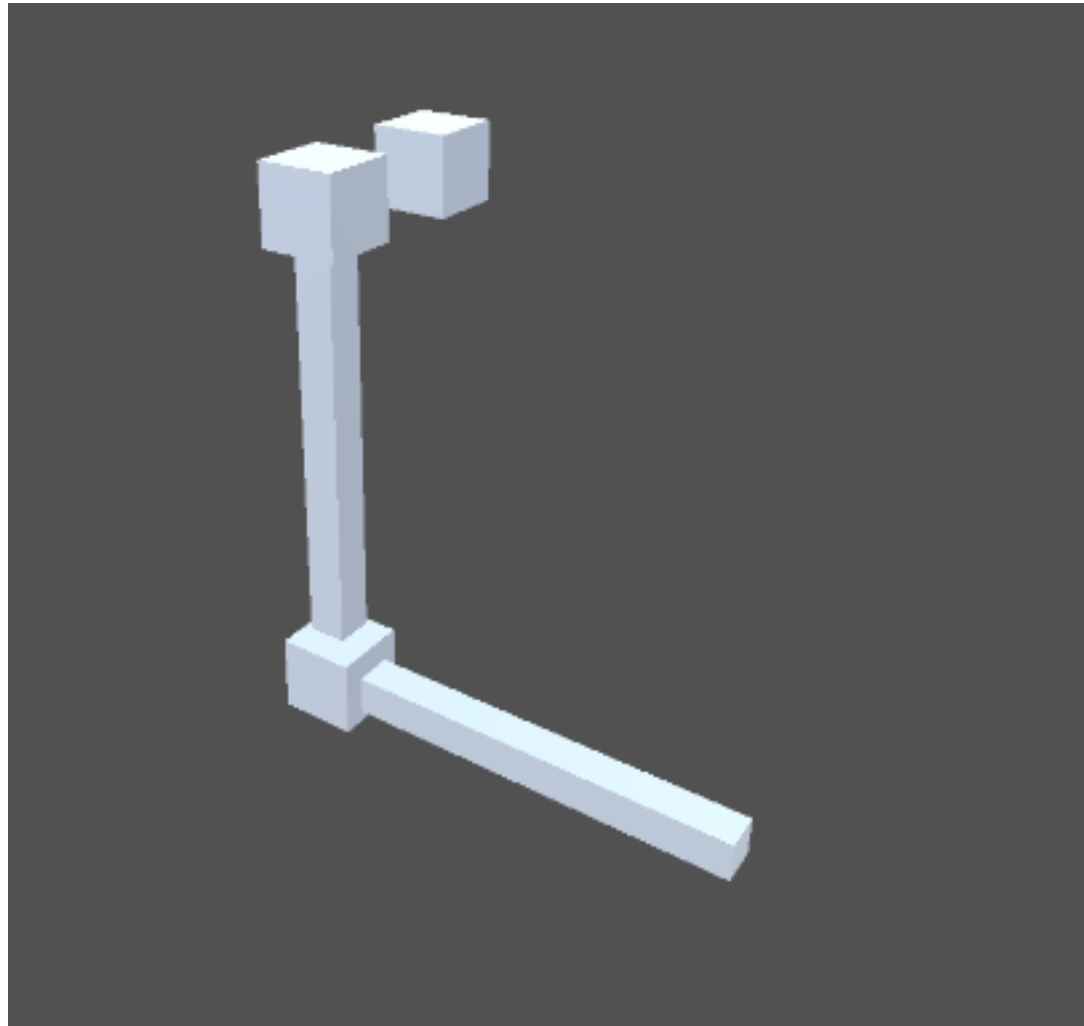
```
public class DemoPerlinRotate : MonoBehaviour
{
    [SerializeField] float XAngleMin;
    [SerializeField] float XAngleMax;
    [SerializeField] float TimeScale;
    [SerializeField] float SeedValue;

    void Start()
    {
        StartCoroutine(ModulateRotation());
    }

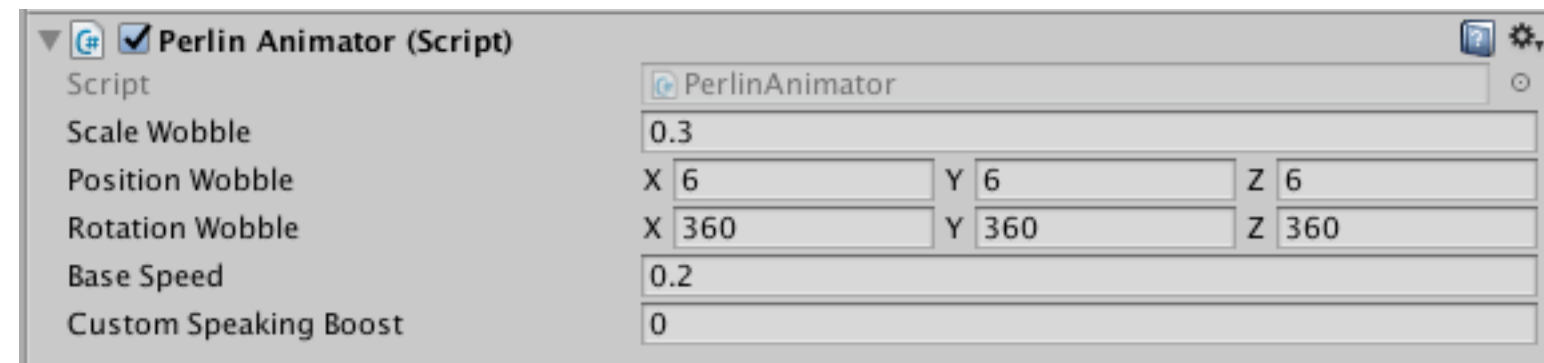
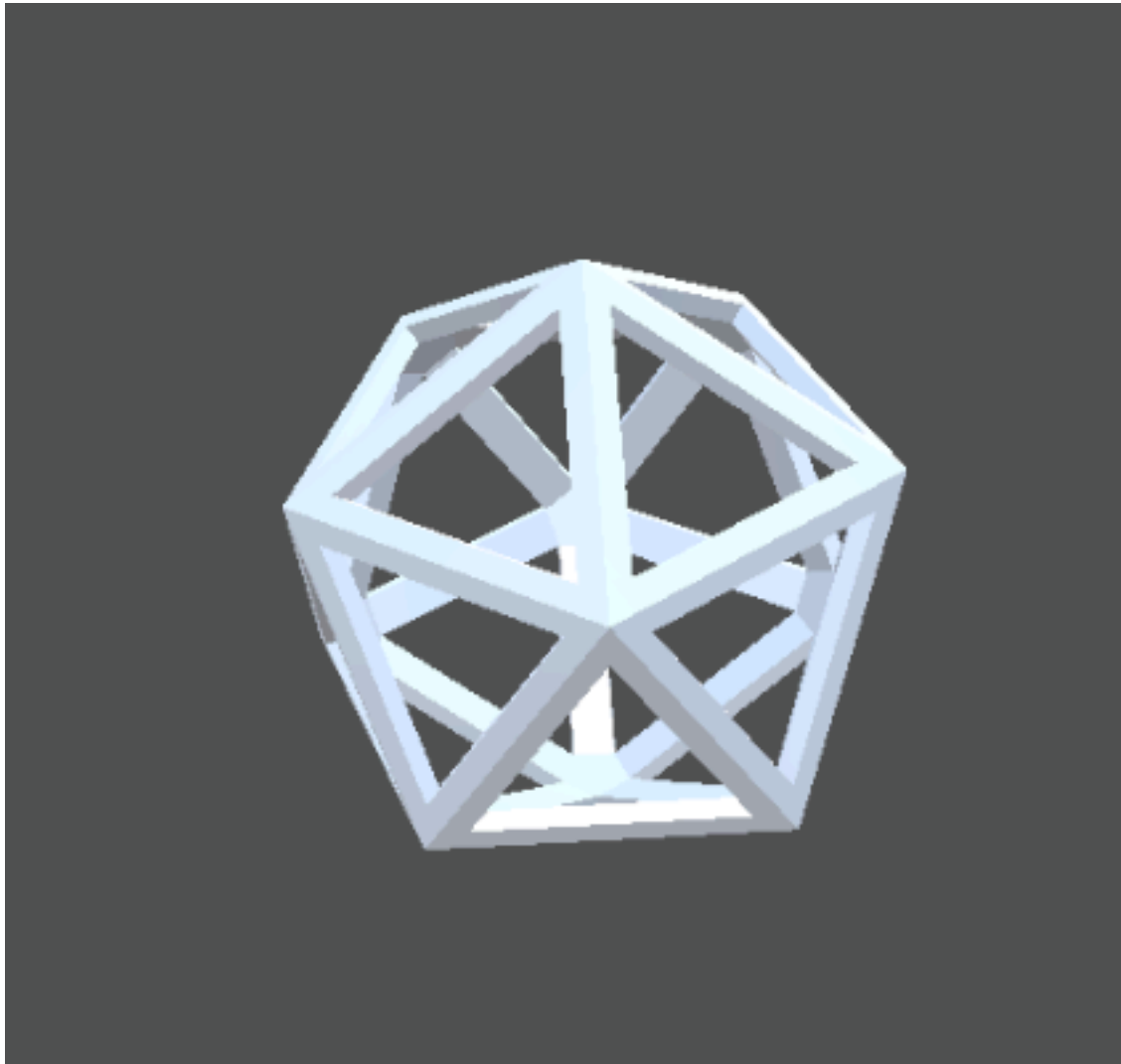
    IEnumerator ModulateRotation()
    {
        Quaternion baseRotation = transform.localRotation;

        while(true)
        {
            float amplitudeNormalized = Mathf.PerlinNoise(Time.time * TimeScale, SeedValue);
            float xAngle = Mathf.Lerp(XAngleMin, XAngleMax, amplitudeNormalized);
            transform.localRotation = baseRotation * Quaternion.Euler(new Vector3(xAngle, 0f, 0f));
            yield return null;
        }
    }
}
```

Hierarchy of Perlin Transform Animations



Our Perlin Animator



Perlin-Animated Characters



Putting a Perlin on Everything



Changing States with Perlin





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Thank You!

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