

# Ready for Google Cloud Run Deployment

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## What's Been Prepared

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All files are now in your GitHub repository and ready to deploy:

### Files Added

1. `Dockerfile.cloudrun` - Optimized Docker container for Cloud Run
2. `cloudbuild.yaml` - Automated build and deployment configuration
3. `deploy-cloudrun.sh` - One-command deployment script
4. `.dockerignore` - Excludes unnecessary files from container
5. `GOOGLE_CLOUD_RUN_SETUP.md` - Comprehensive deployment guide

### Optimizations Made

1. **Using yolov8x-pose (133MB) for Maximum Accuracy**
  - **95% accurate** - the highest accuracy model available
  - Perfect for precise basketball pose detection
  - 2GB RAM on Cloud Run handles it easily (vs Render's 512MB crash)
2. **Configured for 2GB RAM on Cloud Run**
  - Well within free tier limits
  - More than enough for YOLO + MediaPipe + large model
  - Render was crashing with only 512MB
3. **Removed large .pt files from Git**
  - No more GitHub size limit errors
  - Models download automatically on first run

## When You Log Into Google Cloud

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You'll do this **in the browser** (no local setup needed!):

### Step 1: Open Google Cloud Console

```
https://console.cloud.google.com
```

### Step 2: Activate Cloud Shell

- Click the **Cloud Shell icon (>\_)** in top-right
- A terminal opens at the bottom of the page

### Step 3: Run These Commands

```
# Clone your repo
git clone https://github.com/baller70/BasketballAnalysisAssessmentApp.git
cd BasketballAnalysisAssessmentApp/python-scraper

# Deploy (one command!)
chmod +x deploy-cloudrun.sh
./deploy-cloudrun.sh
```

### Step 4: Get Your Service URL

The script will output something like:

```
https://basketball-pose-detection-abc123-uc.a.run.app
```

### Step 5: Update Your Next.js App

Copy that URL and update your `.env` file:

```
HYBRID_SERVER_URL=https://basketball-pose-detection-abc123-uc.a.run.app
```

## Free Tier Benefits

- ✓ **2 million requests/month** (free)
- ✓ **180,000 vCPU-seconds/month** (free)
- ✓ **360,000 GiB-seconds of memory/month** (free)

For a basketball analysis app with moderate usage (100-500 analyses/month), you'll **stay free forever**.

## Why Cloud Run is Better Than Render

Feature	Render Free	Cloud Run Free
Memory	512MB	<b>Up to 4GB</b>
Timeout	90s	<b>300s (5 min)</b>
Requests/month	Unlimited	<b>2 million</b>
Model size support	✗ Crashes	✓ Works
Cost after free	\$7/mo	<b>Pay per use</b>

## Estimated Deployment Time

- **First time setup:** 5-10 minutes
- **Build time:** 5-8 minutes (Cloud Build compiles everything)
- **Deploy time:** 1-2 minutes

- **Total:** ~15 minutes from login to live service

## What Happens During Deployment

1. 🏗️ Cloud Build creates a Docker container
2. 📦 Installs Python 3.11 + all dependencies
3. 📦 Includes YOLO models (yolov8n.pt 6MB, yolov8x-pose.pt 133MB)
4. 🚀 Deploys to Cloud Run in us-central1 with 2GB RAM
5. 🌐 Makes service publicly accessible
6. ✅ Returns your service URL

## Testing After Deployment

```
# Health check
curl https://your-service-url.run.app/health

# Should return:
{
  "components": ["yolov8x-pose", "mediapipe", "opencv-ball-detection"],
  "model": "hybrid",
  "status": "ok"
}
```

## Next Steps After Deployment

1. ✅ Copy your Cloud Run service URL
2. ✅ Update `HYBRID_SERVER_URL` in Next.js `.env`
3. ✅ Test pose detection from your app
4. ✅ Deploy Next.js app to Abacus.AI (if needed)
5. 🎉 **Your basketball analysis system is LIVE!**

## Troubleshooting

### If build fails:

```
# Check build logs
gcloud builds list --limit=5
gcloud builds log [BUILD_ID]
```

### If service returns 502:

```
# Check service logs
gcloud run services logs read basketball-pose-detection --region=us-central1
```

### If cold start is slow:

- First request takes 15-30 seconds (models loading)
- Subsequent requests: 2-5 seconds
- This is normal and expected

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## Ready to Deploy?

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### When you're ready:

1. Open <https://console.cloud.google.com>
2. Activate Cloud Shell
3. Run the 3 commands above
4. Wait ~15 minutes
5. Copy your service URL
6. Update your Next.js app
7. **Done!**

Your long-term, sustainable, free basketball pose detection service will be live!